

```
=> fil reg
FILE 'REGISTRY' ENTERED AT 15:59:14 ON 10 AUG 2007
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Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 9 AUG 2007 HIGHEST RN 944380-35-2
DICTIONARY FILE UPDATES: 9 AUG 2007 HIGHEST RN 944380-35-2

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH December 2, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

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=> d his nofile

(FILE 'HOME' ENTERED AT 13:46:12 ON 10 AUG 2007)

FILE 'HCAPLUS' ENTERED AT 13:46:46 ON 10 AUG 2007
L1      1 SEA ABB=ON  PLU=ON  US2002102466/PN
          SEL RN

FILE 'REGISTRY' ENTERED AT 13:47:37 ON 10 AUG 2007
L2      47 SEA ABB=ON  PLU=ON  (105-37-3/BI OR 105-58-8/BI OR
          107-31-3/BI OR 108-32-7/BI OR 109-60-4/BI OR 109-99-9/BI
          OR 110-71-4/BI OR 110-82-7/BI OR 110-86-1/BI OR 111-96-6/
          BI OR 123-91-1/BI OR 126-33-0/BI OR 141-78-6/BI OR
          14283-07-9/BI OR 16508-95-5/BI OR 21324-40-3/BI OR
          25496-08-6/BI OR 29935-35-1/BI OR 33454-82-9/BI OR
          3741-38-6/BI OR 420-12-2/BI OR 462-06-6/BI OR 554-12-1/BI
          OR 60-29-7/BI OR 616-38-6/BI OR 623-53-0/BI OR 64-17-5/B
          I OR 646-06-0/BI OR 67-56-1/BI OR 67-63-0/BI OR 67-68-5/B
          I OR 68-12-2/BI OR 680-31-9/BI OR 71-43-2/BI OR 74432-42-
          1/BI OR 75-05-8/BI OR 7704-34-9/BI OR 7791-03-9/BI OR
          78-93-3/BI OR 79-20-9/BI OR 822-38-8/BI OR 872-36-6/BI
          OR 90076-65-6/BI OR 930-35-8/BI OR 96-47-9/BI OR
          96-48-0/BI OR 96-49-1/BI)
          D SCA
L3      1 SEA ABB=ON  PLU=ON  "LITHIUM SULFIDE"/CN
L4      1 SEA ABB=ON  PLU=ON  "ETHYLENE SULFITE"/CN
L5      1 SEA ABB=ON  PLU=ON  L2 AND L4

FILE 'LREGISTRY' ENTERED AT 14:24:09 ON 10 AUG 2007
L6      22102 SEA ABB=ON  PLU=ON  (C(L)H(L)S)/ELS

FILE 'REGISTRY' ENTERED AT 14:25:10 ON 10 AUG 2007
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L7	66592	SEA ABB=ON	PLU=ON	(C(L)H(L)S)/ELS AND 3/ELC.SUB
L8	3	SEA ABB=ON	PLU=ON	L2 AND L7
L9	443638	SEA ABB=ON	PLU=ON	(C(L)H(L)O(L)S)/ELS AND 4/ELC.SUB
L10	3	SEA ABB=ON	PLU=ON	L2 AND L9
		D SCA		
L11	6	SEA ABB=ON	PLU=ON	L8 OR L10
L12	1	SEA ABB=ON	PLU=ON	78-93-3/RN
		D SCA		
L13	1	SEA ABB=ON	PLU=ON	PYRIDINE/CN
L14	1	SEA ABB=ON	PLU=ON	"METHYL FORMATE"/CN
L15	1	SEA ABB=ON	PLU=ON	"N-PROPYL ACETATE"/CN
L16	1	SEA ABB=ON	PLU=ON	"ETHYL ETHER"/CN
L17	1	SEA ABB=ON	PLU=ON	623-53-0/RN
L18	1	SEA ABB=ON	PLU=ON	TOLUENE/CN
L19	1	SEA ABB=ON	PLU=ON	FLUOROTOLUENE/CN
L20	1	SEA ABB=ON	PLU=ON	BENZENE/CN
L21	1	SEA ABB=ON	PLU=ON	FLUOROBENZENE/CN
L22	1	SEA ABB=ON	PLU=ON	P-DIOXANE/CN
L23	1	SEA ABB=ON	PLU=ON	CYCLOHEXANE/CN
L24	12	SEA ABB=ON	PLU=ON	(L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23)
L25	1	SEA ABB=ON	PLU=ON	METHANOL/CN
L26	1	SEA ABB=ON	PLU=ON	HEXAMETHYLPHOSPHORAMIDE/CN
L27	1	SEA ABB=ON	PLU=ON	ETHANOL/CN
L28	1	SEA ABB=ON	PLU=ON	ISOPROPANOL/CN
L29	4	SEA ABB=ON	PLU=ON	(L25 OR L26 OR L27 OR L28)
L30	1	SEA ABB=ON	PLU=ON	"ETHYLENE CARBONATE"/CN
L31	1	SEA ABB=ON	PLU=ON	"PROPYLENE CARBONATE"/CN
L32	1	SEA ABB=ON	PLU=ON	"DIMETHYL SULFOXIDE"/CN
L33	1	SEA ABB=ON	PLU=ON	SULFOLANE/CN
L34	1	SEA ABB=ON	PLU=ON	96-48-0/RN
L35	1	SEA ABB=ON	PLU=ON	ACETONITRILE/CN
L36	1	SEA ABB=ON	PLU=ON	L2 AND FORMAMIDE

FILE 'HCAPLUS' ENTERED AT 15:34:46 ON 10 AUG 2007

L37	QUE ABB=ON	PLU=ON	BATTER?
L38	551 SEA ABB=ON	PLU=ON	L7(L)L37

FILE 'REGISTRY' ENTERED AT 15:36:37 ON 10 AUG 2007

L39	443638 SEA ABB=ON	PLU=ON	L9 OR L9
	D RN 220000		
L40	223639 SEA RAN=(,136164-44-8)	ABB=ON	PLU=ON L9 OR L9
L41	219999 SEA ABB=ON	PLU=ON	L39 NOT L40

FILE 'HCAPLUS' ENTERED AT 15:38:15 ON 10 AUG 2007

L42	1381 SEA ABB=ON	PLU=ON	L40(L)L37
L43	184 SEA ABB=ON	PLU=ON	L41(L)L37
L44	QUE ABB=ON	PLU=ON	(LI OR LITHIUM? OR LI(A)S) (2A) BATTER?
L45	1206 SEA ABB=ON	PLU=ON	(L38 OR L42 OR L43) AND L44
L46	290648 SEA ABB=ON	PLU=ON	L24
L47	325 SEA ABB=ON	PLU=ON	L45 AND L46
L48	QUE ABB=ON	PLU=ON	(SECOND? OR 2ND OR 2(W)ND) (A) SOLVENT?
L49	7 SEA ABB=ON	PLU=ON	L47 AND L48
L50	QUE ABB=ON	PLU=ON	ELECTROLY?
L51	2492 SEA ABB=ON	PLU=ON	L24(L)L50
L52	244 SEA ABB=ON	PLU=ON	L47 AND L51
L53	QUE ABB=ON	PLU=ON	SOLVENT?
L54	174 SEA ABB=ON	PLU=ON	L52 AND L53
L55	QUE ABB=ON	PLU=ON	(LI(A)S OR LITHIUM(A) SULFUR) (2A) BATTE R?

L56 7 SEA ABB=ON PLU=ON L54 AND L55
L57 0 SEA ABB=ON PLU=ON L49 AND L55
L58 7 SEA ABB=ON PLU=ON L49 AND L51
L59 2563 SEA ABB=ON PLU=ON (L25 OR L26 OR L27 OR L28) (L)L50
L60 8490 SEA ABB=ON PLU=ON ((L30 OR L31 OR L32 OR L33 OR L34 OR
L35 OR L36)) (L)L50
L61 4 SEA ABB=ON PLU=ON (L56 OR L58) AND L59
L62 14 SEA ABB=ON PLU=ON (L56 OR L58) AND L60

=> fil hcap
FILE 'HCAPLUS' ENTERED AT 15:59:17 ON 10 AUG 2007
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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FILE COVERS 1907 - 10 Aug 2007 VOL 147 ISS 8
FILE LAST UPDATED: 9 Aug 2007 (20070809/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d 156 ibib abs hitstr hitind 1-7

L56 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:544098 HCAPLUS Full-text
DOCUMENT NUMBER: 145:30918
TITLE: Electrolyte for lithium-sulfur batteries
INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena
PATENT ASSIGNEE(S): Oxis Energy Ltd., UK
SOURCE: PCT Int. Appl., 24 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2006059085	A1	<u>20060608</u>	WO 2005-GB4572	200511 29

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM,
 KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG,
 MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT,
 RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT,
 TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
 RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
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 ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

GB 2420907 A 20060607 GB 2005-4290

200503
02

GB 2420907 B 20060913

EP 1815546 A1 20070808 EP 2005-818427

200511
29

R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
 IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK,
 TR

PRIORITY APPLN. INFO.:

RU 2004-135236

A
200412
02

GB 2005-4290

A
200503
02

US 2005-657436P

P
200503
02

WO 2005-GB4572

W
200511
29

AB An electrolyte for a lithium-sulfur battery, the electrolyte comprising a solution of at least one electrolyte salt in at least two aprotic solvents. The components of the solution are selected so that the solution is eutectic or close to eutectic. Also disclosed is a lithium-sulfur battery including such an electrolyte. By using a eutectic mixture, the performance of the electrolyte and the battery at low temps. is much improved.

IT 109-60-4, Propyl acetate 126-33-0, Sulfolane
 623-53-0, Ethyl methyl carbonate 917-73-7
 1003-78-7, 2,4-Dimethylsulfolane 1977-37-3,
 Methylpropylsulfone 7560-59-0, Methylbutylsulfone
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)

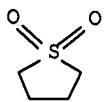
RN 109-60-4 HCPLUS

CN Acetic acid, propyl ester (CA INDEX NAME)

n-Pr—O—Ac

RN 126-33-0 HCPLUS

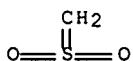
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



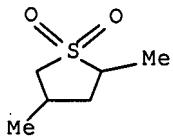
RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



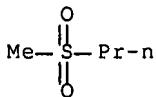
RN 917-73-7 HCPLUS
CN Methanethial, S,S-dioxide (9CI) (CA INDEX NAME)



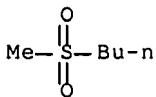
RN 1003-78-7 HCPLUS
CN Thiophene, tetrahydro-2,4-dimethyl-, 1,1-dioxide (CA INDEX NAME)



RN 1977-37-3 HCPLUS
CN Propane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



RN 7560-59-0 HCPLUS
CN Butane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
 (electrolyte for lithium-sulfur
 batteries)
IT Sulfones
RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
IT Amines, uses
RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
IT Secondary batteries
 (lithium; electrolyte for lithium-
 sulfur batteries)
IT Lithium alloy, base
RL: TEM (Technical or engineered material use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
IT 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran
96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 108-32-7,
Propylene carbonate 109-60-4, Propyl acetate 109-99-9,
Thf, uses 110-71-4 111-96-6, Diglyme 126-33-0,
Sulfolane 141-78-6, Ethyl acetate, uses 143-24-8, Tetraglyme
554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate
623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane
917-73-7 1003-78-7, 2,4-Dimethylsulfolane
1977-37-3, Methylpropylsulfone 7439-93-2, Lithium, uses
7560-59-0, Methylbutylsulfone 7791-03-9, Lithium
perchlorate 12136-58-2, Lithium sulfide 21324-40-3, Lithium
hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
56525-42-9, Methyl propyl carbonate, uses 90076-65-6
RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
IT 7446-09-5, Sulfur dioxide, uses 7553-56-2, Iodine, uses
7704-34-9, Sulfur, uses 7726-95-6, Bromine, uses 7782-50-5,
Chlorine, uses 10024-97-2, Nitrous oxide, uses 74432-42-1,
Lithium polysulfide
RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L56 ANSWER 2 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:529227 HCPLUS Full-text
DOCUMENT NUMBER: 145:11315
TITLE: Electrolyte for lithium-sulfur
 batteries and lithium
 sulfur batteries using the
 same
INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena
PATENT ASSIGNEE(S): Oxis Energy Limited, UK; Intellikraft Limited
SOURCE: Brit. UK Pat. Appl., 23 pp.
CODEN: BAXXDU

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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GB 2420907	A	20060607	GB 2005-4290	200503 02
GB 2420907	B	20060913		
WO 2006059085	A1	20060608	WO 2005-GB4572	200511 29
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
EP 1815546	A1	20070808	EP 2005-818427	200511 29
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US 2006121355	A1	20060608	US 2005-290825	200512 01
PRIORITY APPLN. INFO.:			RU 2004-135236	A
				200412 02
			GB 2005-4290	A
				200503 02
			US 2005-657436P	P
				200503 02
			WO 2005-GB4572	W
				200511 29

AB An electrolyte for a lithium-sulfur battery comprises a solution of ≥ 1 electrolyte salt in ≥ 2 aprotic solvents. The components of the solution are selected so that the solution is eutectic or close to eutectic. Also disclosed is a lithium-sulfur battery including such an electrolyte. By using a eutectic mixture, the performance of the electrolyte and the battery at low temps. is much improved.

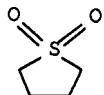
IT 109-60-4, Propylacetate 126-33-0, Sulfolane
623-53-0, Ethylmethylcarbonate 1003-78-7,
2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone

7560-59-0, Methylbutylsulfone 31124-38-6,
Ethylbutylsulfone
RL: NUU (Other use, unclassified); TEM (Technical or engineered
material use); USES (Uses)
(lithium sulfur battery
electrolytes)

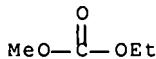
RN 109-60-4 HCPLUS
CN Acetic acid, propyl ester (CA INDEX NAME)

n-Pr—O—Ac

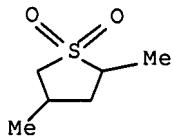
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



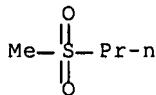
RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



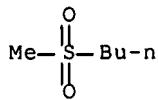
RN 1003-78-7 HCPLUS
CN Thiophene, tetrahydro-2,4-dimethyl-, 1,1-dioxide (CA INDEX NAME)



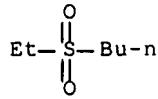
RN 1977-37-3 HCPLUS
CN Propane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



RN 7560-59-0 HCPLUS
CN Butane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



RN 31124-38-6 HCAPLUS
 CN Butane, 1-(ethylsulfonyl)- (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 ST lithium sulfur battery electrolyte
 IT Battery electrolytes
 Eutectics
 (lithium sulfur battery
 electrolytes)
 IT Amines, uses
 Carbon black, uses
 Polyoxyalkylenes, uses
 Sulfones
 RL: NUU (Other use, unclassified); TEM (Technical or engineered
 material use); USES (Uses)
 (lithium sulfur battery
 electrolytes)
 IT Lithium alloy, base
 RL: NUU (Other use, unclassified); TEM (Technical or engineered
 material use); USES (Uses)
 (lithium sulfur battery
 electrolytes)
 IT 79-20-9, Methylacetate 96-47-9, 2-Methyltetrahydrofuran 96-48-0,
 γ -Butyrolactone 96-49-1, Ethylene carbonate 105-37-3,
 Ethylpropionate 105-58-8, Diethylcarbonate 108-32-7, Propylene
 carbonate 109-60-4, Propylacetate 109-99-9, THF, uses
 110-71-4 111-96-6, Diglyme 124-38-9, Carbon dioxide, uses
 126-33-0, Sulfolane 141-78-6, Ethylacetate, uses
 143-24-8, Tetruglyme 554-12-1, Methylpropionate 616-38-6,
 Dimethylcarbonate 623-53-0, Ethylmethylcarbonate
 646-06-0, 1,3-Dioxolane 1003-78-7, 2,4-Dimethylsulfolane
 1977-37-3, Methylpropylsulfone 7439-93-2D, Lithium,
 derivs. 7446-09-5, Sulfur dioxide, uses 7560-59-0,
 Methylbutylsulfone 7704-34-9D, Sulfur, derivs./polymers
 7782-50-5, Chlorine, uses 7791-03-9, Lithium perchlorate
 10024-97-2, Dinitrogen oxide, uses 18496-25-8, Sulfide
 20461-54-5, Iodide, uses 21324-40-3, Lithium hexafluorophosphate
 24959-67-9, Bromide, uses 25322-68-3, Polyethylene oxide
 29935-35-1, Lithium hexafluoroarsenate 31124-38-6,
 Ethylbutylsulfone 33454-82-9, Lithium trifluoromethane sulfonate
 39448-96-9 56525-42-9, Methylpropylcarbonate, uses 74432-42-1,
 Lithium sulfide (Li₂(Sx)) 90076-65-6, Lithium

bis(trifluoromethanesulfonyl)imide
RL: NUU (Other use, unclassified); TEM (Technical or engineered
material use); USES (Uses)
(lithium sulfur battery
electrolytes)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L56 ANSWER 3 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:402981 HCPLUS Full-text
DOCUMENT NUMBER: 140:409628
TITLE: Organic electrolytic solution for
lithium battery
INVENTOR(S): Kim, Ju-Yup; Ryu, Young-Gyo; Cho, Myung-Dong
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 19 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1420474	A1	20040519	EP 2003-254063	200306 26
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004043045	A	20040522	KR 2002-71043	200211 15
US 2004096749	A1	20040520	US 2003-601907	200306 24
CN 1501540	A	20040602	CN 2003-148467	200306 30
JP 2004172117	A	20040617	JP 2003-382538	200311 12
PRIORITY APPLN. INFO.:			KR 2002-71043	A 200211 15

OTHER SOURCE(S): MARPAT 140:409628
AB An organic electrolytic solution containing a lithium salt, an organic solvent, and an oxalate compound, and a lithium battery using the organic electrolytic solution are provided. Due to the oxalate compound, the organic electrolytic solution stabilizes lithium metal and improves the conductivity of lithium ions. Also, the organic electrolytic solution present invention improves charging/discharging efficiency when used in lithium batteries having a lithium metal anode. Especially when the organic electrolytic solution is used in lithium sulfur batteries, the oxalate compound forms a chelate with lithium ions and improves the ionic conductivity and the charging/discharging efficiency of the battery. In addition, due to the chelation of the lithium ions, neg. sulfur ions remain free without interaction with lithium ions, are highly likely to dissolve

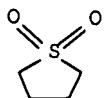
in an electrolytic solution. As a result, a reversible capacity of sulfur is improved.

IT 126-33-0, Sulfolane 623-53-0, Ethyl methyl carbonate

RL: DEV (Device component use); USES (Uses)
(organic electrolytic solution for lithium battery)

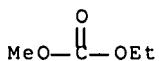
RN 126-33-0 HCPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 623-53-0 HCPLUS

CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery org electrolyte soln

IT Secondary batteries

(lithium; organic electrolytic solution for lithium battery)

IT Battery electrolytes

(organic electrolytic solution for lithium battery)

IT Lithium alloy, base

RL: DEV (Device component use); USES (Uses)

(organic electrolytic solution for lithium battery)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate

105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate

110-71-4 111-96-6, Diethylene glycol dimethyl ether 112-36-7,

Diethylene glycol diethyl ether 112-49-2, Triethylene glycol

dimethyl ether 126-33-0, Sulfolane 463-79-6D, Carbonic

acid, ester 616-38-6, Dimethyl carbonate 623-53-0, Ethyl

methyl carbonate 646-06-0, Dioxolane 872-36-6, Vinylene

carbonate 1072-47-5, 1,3-Dioxolane, 4-methyl 1072-57-7,

1,3-Dioxolane, 4,5-dimethyl 4499-99-4, Triethylene glycol diethyl

ether 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses

12137-46-1, Kasolite 29921-38-8, 1,3-Dioxolane, 4-ethyl

31371-55-8, Ethane, 1,2-dimethoxy-homopolymer 73506-93-1,

Diethoxyethane 183140-14-9, 1,3-Dioxetan-2-one 676610-04-1,

1,3-Dioxolane, 4,5-diethyl

RL: DEV (Device component use); USES (Uses)

(organic electrolytic solution for lithium battery)

IT 95-92-1, Diethyl oxalate 338-70-5, uses 553-90-2, Dimethyl

oxalate 615-98-5, Dipropyl oxalate 2050-60-4, Dibutyloxalate

7704-34-9D, Sulfur, organic compds. 18241-31-1, Bis(4-

methylbenzyl)oxalate 74432-42-1, Lithium polysulfide

RL: MOA (Modifier or additive use); USES (Uses)
(organic electrolytic solution for lithium battery)

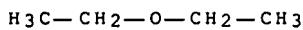
L56 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:84081 HCAPLUS Full-text
DOCUMENT NUMBER: 136:137403
TITLE: Electrolyte for a lithium-
sulfur battery
INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok;
Lee, Jeawoan; Jung, Yongju; Kim, Joosoak
PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 7 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1176659	A2	20020130	EP 2001-117661	200107 25
EP 1176659	A3	20060531		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
KR 2002008704	A	20020131	KR 2000-42736	200007 25
KR 2002008705	A	20020131	KR 2000-42737	200007 25
JP 2002075447	A	20020315	JP 2001-213435	200107 13
US 2002102466	A1	20020801	US 2001-910952	200107 24
CN 1335653	A	20020213	CN 2001-132526	200107 25
PRIORITY APPLN. INFO.:			KR 2000-42736	A
				200007 25
			KR 2000-42737	A
				200007 25

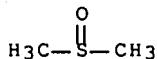
AB An electrolyte for a lithium-sulfur battery has a solvent having a dielectric constant that is greater than or equal to 20, a solvent having a viscosity that is less than or equal to 1.3, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.
IT 60-29-7, Ethyl ether, uses 67-68-5, DMSO, uses 71-43-2, Benzene, uses 78-93-3, Methyl ethyl ketone, uses 107-31-3, Methyl formate 109-60-4, n-Propyl acetate 110-82-7, Cyclohexane, uses 110-86-1, Pyridine, uses 123-91-1, p-Dioxane, uses 126-33-0, Sulfolane 420-12-2, Ethylene sulfide

462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 822-38-8, Ethylene trithiocarbonate 930-35-8, Vinylene trithiocarbonate 3741-38-6, Ethylene sulfite 25496-08-6, Fluorotoluene
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

RN 60-29-7 HCPLUS
CN Ethane, 1,1'-oxybis- (CA INDEX NAME)



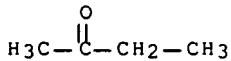
RN 67-68-5 HCPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



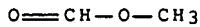
RN 71-43-2 HCPLUS
CN Benzene (CA INDEX NAME)



RN 78-93-3 HCPLUS
CN 2-Butanone (CA INDEX NAME)



RN 107-31-3 HCPLUS
CN Formic acid, methyl ester (CA INDEX NAME)



RN 109-60-4 HCPLUS
CN Acetic acid, propyl ester (CA INDEX NAME)



RN 110-82-7 HCAPLUS
CN Cyclohexane (CA INDEX NAME)



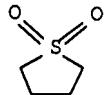
RN 110-86-1 HCAPLUS
CN Pyridine (CA INDEX NAME)



RN 123-91-1 HCAPLUS
CN 1,4-Dioxane (CA INDEX NAME)



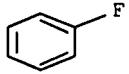
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



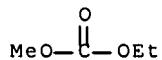
RN 420-12-2 HCAPLUS
CN Thiirane (CA INDEX NAME)



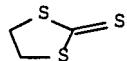
RN 462-06-6 HCAPLUS
CN Benzene, fluoro- (CA INDEX NAME)



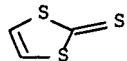
RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



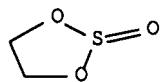
RN 822-38-8 HCPLUS
CN 1,3-Dithiolane-2-thione (CA INDEX NAME)



RN 930-35-8 HCPLUS
CN 1,3-Dithiole-2-thione (CA INDEX NAME)



RN 3741-38-6 HCPLUS
CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)



RN 25496-08-6 HCPLUS
CN Benzene, fluoromethyl- (CA INDEX NAME)



D1-F

D1-Me

IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
 (electrolyte for lithium-sulfur
 battery)
IT Secondary batteries
 (lithium; electrolyte for lithium-

sulfur battery)

IT 60-29-7, Ethyl ether, uses 64-17-5, Ethanol, uses
67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 67-68-5
, Dmso, uses 68-12-2, Dmf, uses 71-43-2, Benzene, uses
75-05-8, Acetonitrile, uses 78-93-3, Methylethyl ketone,
uses 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran
96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate
105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate
107-31-3, Methyl formate 108-32-7, Propylene carbonate
109-60-4, n-Propyl acetate 109-99-9, Thf, uses 110-71-4,
1,2-Dimethoxyethane 110-82-7, Cyclohexane, uses
110-86-1, Pyridine, uses 111-96-6, Diglyme
123-91-1, p-Dioxane, uses 126-33-0, Sulfolane
141-78-6, Ethyl acetate, uses 420-12-2, Ethylene sulfide
462-06-6, Fluorobenzene 554-12-1, Methyl propionate
616-38-6, Dimethyl carbonate 623-53-0, Ethylmethyl
carbonate 646-06-0, 1,3-Dioxolane 680-31-9,
Hexamethylphosphoramide, uses 822-38-8, Ethylene
trithiocarbonate 872-36-6, Vinylene carbonate 930-35-8,
Vinylene trithiocarbonate 3741-38-6, Ethylene sulfite
7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate
14283-07-9, Lithium tetrafluoroborate 16508-95-5, Bismuth
carbonate 21324-40-3, Lithium hexafluorophosphate
25496-08-6, Fluorotoluene 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium triflate 74432-42-1,
Lithium polysulfide 90076-65-6
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

L56 ANSWER 5 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:84080 HCPLUS Full-text
DOCUMENT NUMBER: 136:137402
TITLE: Electrolyte for a lithium-
sulfur battery
INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok;
Lee, Jeawoan; Jung, Yongju; Kim, Joosoak
PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1176658	A2	20020130	EP 2001-117642	200107 24
EP 1176658	A3	20060531	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR	
KR 2002008703	A	20020131	KR 2000-42735	200007 25
KR 2002014196	A	20020225	KR 2000-47348	200008 17

JP 2002083633	A	20020322	JP 2001-213414	
				200107
				13
US 2002045101	A1	20020418	US 2001-911083	
				200107
				24
US 6852450	B2	20050208	CN 2001-132525	
CN 1335652	A	20020213		200107
				25
PRIORITY APPLN. INFO.:			KR 2000-42735	A
				200007
				25
			KR 2000-47348	A
				200008
				17

AB An electrolyte for a lithium-sulfur battery includes a first component solvent with a sulfur solubility more than or equal to 20 mM, a second component solvent with a sulfur solubility less than 20 mM, a third component solvent with a high dielec. constant and a high viscosity, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.

IT 71-43-2, Benzene, uses 108-88-3, Toluene, uses 109-60-4, Propyl acetate 110-82-7, Cyclohexane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur battery)

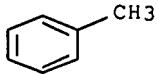
RN 71-43-2 HCPLUS

CN Benzene (CA INDEX NAME)



RN 108-88-3 HCPLUS

CN Benzene, methyl- (CA INDEX NAME)



RN 109-60-4 HCPLUS

CN Acetic acid, propyl ester (CA INDEX NAME)

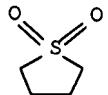
n-Pr—O—Ac

RN 110-82-7 HCPLUS

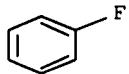
CN Cyclohexane (CA INDEX NAME)



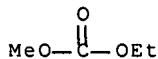
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 462-06-6 HCPLUS
CN Benzene, fluoro- (CA INDEX NAME)



RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
 (electrolyte for lithium-sulfur
 battery)
IT Secondary batteries
 (lithium; electrolyte for lithium-
 sulfur battery)
IT Synthetic polymeric fibers, uses
 RL: DEV (Device component use); USES (Uses)
 (polysulfides, carbon-polysulfur polymer; electrolyte for
 lithium-sulfur battery)
IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 battery)
IT 7440-44-0, Super P, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (activated; electrolyte for lithium-sulfur
 battery)

IT 64-17-5, Ethanol, uses 67-63-0, Isopropanol, uses 71-43-2, Benzene, uses 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 108-94-1, Cyclohexanone, uses 109-60-4, Propyl acetate 109-99-9, Thf, uses 110-71-4 110-82-7, Cyclohexane, uses 111-96-6, Diglyme 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses 143-24-8, Tetraglyme 462-06-6, Fluorobenzene 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethylmethyl carbonate 646-06-0, 1,3-Dioxolane 1330-20-7, Xylene, uses 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, organic compound 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9, Methylpropyl carbonate, uses 74432-42-1, Lithium polysulfide 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur battery)

IT 124-38-9, Carbon dioxide, uses 7446-09-5, Sulfur dioxide, uses 9003-20-7, Polyvinyl acetate 10024-97-2, Nitrous oxide, uses 90076-65-6
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte for lithium-sulfur battery)

L56 ANSWER 6 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2000:141485 HCPLUS Full-text
 DOCUMENT NUMBER: 132:168757
 TITLE: Liquid electrolyte lithium-sulfur batteries
 INVENTOR(S): Chu, May-Ying; De Jonghe, Lutgard C.; Visco, Steven J.; Katz, Bruce D.
 PATENT ASSIGNEE(S): Polyplus Battery Co., Inc., USA
 SOURCE: U.S., 28 pp., Cont.-in-part of U.S. 5,686,201
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 15
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6030720	A	20000229	US 1997-948969	199710 10
US 5523179	A	19960604	US 1994-344384	199411 23
US 5582623	A	19961210	US 1995-479687	199506 07
US 5686201	A	19971111	US 1996-686609	199607 26
CA 2305454	A1	19990422	CA 1998-2305454	199810

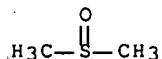
WO 9919931	A1	19990422	WO 1998-US21067	06
				199810
				06
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 9896876	A	19990503	AU 1998-96876	199810
				06
AU 741815	B2	20011213		
EP 1021849	A1	20000726	EP 1998-950967	199810
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EP 1021849	B1	20030122		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9812749	A	20000829	BR 1998-12749	199810
				06
JP 2001520447	T	20011030	JP 2000-516392	199810
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AT 231653	T	20030215	AT 1998-950967	199810
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US 6358643	B1	20020319	US 2000-495639	200002
				01
PRIORITY APPLN. INFO.:			US 1994-344384	A2
				199411
				23
			US 1995-479687	A2
				199506
				07
			US 1996-686609	A2
				199607
				26
			US 1997-948969	A
				199710
				10
			WO 1998-US21067	W
				199810
				06

OTHER SOURCE(S): MARPAT 132:168757

AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH₂CH₂O)_nR2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with

$(CH_2CH_2O)_n$ form a closed ring. Examples of linear **solvents** include the glymes $(CH_3O(CH_2CH_2)_nCH_3$). Some electrolyte **solvents** include a donor or acceptor **solvent** in addition to an ethoxy compound as described. Examples of donor **solvents** include hexamethylphosphoramide, **pyridine**, **N,N-diethylacetamide**, **N,N-diethylformamide**, **dimethylsulfoxide**, **tetramethylurea**, **N,N-dimethylacetamide**, **N,N-dimethylformamide**, **tributylphosphate**, **trimethylphosphate**, **N,N,N',N'-tetraethylsulfamide**, **tetramethylenediamine**, **tetramethylpropylenediamine**, and **pentamethyldiethylenetriamine**. These assist in solvation of lithium ions. Examples of acceptor **solvents** include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 67-68-5, Dimethylsulfoxide, uses 110-86-1,
 Pyridine, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (liquid electrolyte lithium-sulfur batteries)
 RN 67-68-5 HCPLUS
 CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 110-86-1 HCPLUS
 CN Pyridine (CA INDEX NAME)



IC ICM H01M010-40
 INCL 429105000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST battery lithium sulfur liq electrolyte
 IT Battery electrolytes
 Conducting polymers
 (liquid electrolyte lithium-sulfur batteries)
 IT Carbon black, uses
 Polyoxyalkylenes, uses
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (liquid electrolyte lithium-sulfur batteries)
 IT Alcohols, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (liquid electrolyte lithium-sulfur batteries)
 IT Crown ethers
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (liquid electrolyte lithium-sulfur batteries)

IT Cryptands
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT Glycols, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT Secondary batteries
(lithium; liquid electrolyte lithium-sulfur batteries)

IT Intercalation compounds
RL: DEV (Device component use); USES (Uses)
(lithium; liquid electrolyte lithium-sulfur batteries)

IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7440-23-5, Sodium, uses 7704-34-9, Sulfur, uses 90076-65-6
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 25322-68-3, Polyethylene oxide
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 75-52-5, Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses 107-21-1, Ethylene glycol, uses 110-60-1, Tetramethylenediamine 110-86-1, Pyridine, uses 110-95-2, Tetramethylpropylenediamine 126-73-8, Tributylphosphate, uses 127-19-5, N,N-Dimethylacetamide 143-24-8, Tetraglyme 294-93-9, 12-Crown-4 512-56-1, Trimethylphosphate 617-84-5, N,N-Diethylformamide 632-22-4, Tetramethylurea 680-31-9, Hexamethylphosphoramide, uses 685-91-6, N,N-Diethylacetamide 1493-13-6, Trifluoromethanesulfonic acid 2832-49-7, N,N,N',N'-Tetraethylsulfamide 3030-47-5, Pentamethyldiethylenetriamine 7446-09-5, Sulfur dioxide, uses 7637-07-2, Boron trifluoride, uses 14187-32-7, Dibenzo 18-crown-6 17455-13-9, 18-Crown-6 33100-27-5, 15-Crown-5
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L56 ANSWER 7 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:271600 HCPLUS Full-text
DOCUMENT NUMBER: 130:284490
TITLE: Liquid electrolyte lithium-sulfur batteries
INVENTOR(S): Chu, May-Ying; De Jonghe, Lutgard C.; Visco,

PATENT ASSIGNEE(S): Steven J.; Katz, Bruce D.
 SOURCE: Polyplus Battery Company, Inc., USA
 PCT Int. Appl., 57 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 15
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9919931	A1	19990422	WO 1998-US21067	199810 06
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6030720	A	20000229	US 1997-948969	199710 10
CA 2305454	A1	19990422	CA 1998-2305454	199810 06
AU 9896876	A	19990503	AU 1998-96876	199810 06
AU 741815	B2	20011213		
EP 1021849	A1	20000726	EP 1998-950967	199810 06
EP 1021849	B1	20030122		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9812749	A	20000829	BR 1998-12749	199810 06
JP 2001520447	T	20011030	JP 2000-516392	199810 06
AT 231653	T	20030215	AT 1998-950967	199810 06
PRIORITY APPLN. INFO.:			US 1997-948969	A 199710 10
			US 1994-344384	A2 199411 23
			US 1995-479687	A2 199506 07

US 1996-686609

A2

199607
26

WO 1998-US21067

W

199810
06

OTHER SOURCE(S): MARPAT 130:284490

AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH2CH2O)nR2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH2CH2O)n form a closed ring. Examples of linear solvents include the glymes (CH3O(CH2CH2)nCH3). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 67-68-5, Dimethylsulfoxide, uses 110-86-1,

Pyridine, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(liquid electrolyte lithium-sulfur batteries)

RN 67-68-5 HCPLUS

CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 110-86-1 HCPLUS

CN Pyridine (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST electrolyte solvent lithium sulfur
battery

IT Battery cathodes

Battery electrolytes

Secondary batteries

(liquid electrolyte lithium-sulfur
batteries)

IT Alcohols, uses

Carbon black, uses
Carbon fibers, uses
Glycols, uses
Polyoxyalkylenes, uses
Polysulfides
Sulfides, uses
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

IT Crown ethers
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

IT Cryptands
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

IT 143-24-8, Tetraethyleneglycol dimethyl ether 7439-93-2, Lithium,
uses 7439-93-2D, Lithium, intercalation compound, uses 7440-23-5,
Sodium, uses 7440-44-0, Carbon, uses 7704-34-9, Sulfur, uses
7791-03-9, Lithium perchlorate 14283-07-9, Lithium
tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
25322-68-3, Peo 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium triflate 74432-42-1, Lithium polysulfide
90076-65-6
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses
68-12-2, N,N-Dimethylformamide, uses 75-52-5, Nitromethane, uses
76-05-1, Trifluoroacetic acid, uses 107-21-1, Ethylene glycol,
uses 110-60-1, Tetramethylenediamine 110-86-1, Pyridine,
uses 110-95-2, Tetramethylpropylenediamine 126-73-8,
Tributylphosphate, uses 127-19-5, N,N-Dimethylacetamide
512-56-1, Trimethylphosphate 617-84-5, N,N-Diethylformamide
632-22-4, Tetramethylurea 680-31-9, Hexamethylphosphoramide, uses
685-91-6, N,N-Diethylacetamide 1493-13-6, Trifluoromethanesulfonic
acid 1822-45-3, Tetramethylpropylenediamine 2832-49-7,
N,N,N',N'-Tetraethylsulfamide 3030-47-5,
Pentamethyldiethylenetriamine. 7446-09-5, Sulfur dioxide, uses
7637-07-2, Boron trifluoride, uses
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

IT 294-93-9, 12-Crown-4 14187-32-7, Dibenzo-18-crown-6 17455-13-9,
18-Crown-6 33100-27-5, 15-Crown-5
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

=> d 158 ibib abs hitstr hitind 1-7

L58 ANSWER 1 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1129877 HCPLUS Full-text
DOCUMENT NUMBER: 143:408181

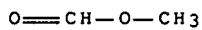
TITLE: Secondary lithium batteries
 with good cycle efficiency and durability
 INVENTOR(S): Imasaka, Koji; Fujioka, Yuichi; Hashimoto,
 Tsutomu; Tajima, Hidehiko; Adachi, Kazuyuki;
 Shibata, Hiroyuki; Kai, Masaaki
 PATENT ASSIGNEE(S): Mitsubishi Heavy Industries, Ltd., Japan; Kyushu
 Electric Power Co., Ltd.
 SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005294028	A	20051020	JP 2004-107291	200403 31
PRIORITY APPLN. INFO.:		JP 2004-107291		200403 31

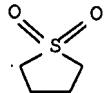
AB The batteries contain Li-containing mixed oxides as cathode active mass, Li-doped graphite as anode active mass, and nonaq. electrolytes, and show terminal potential of discharge against Li ≤ 0.5 V.
 IT 67-68-5, Dimethyl sulfoxide, uses 107-31-3, Methyl formate 126-33-0, Sulfolane 623-53-0, Ethyl methyl carbonate 872-93-5, 3-Methylsulfolane
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solvent; secondary lithium batteries with good cycle efficiency and durability)
 RN 67-68-5 HCPLUS
 CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



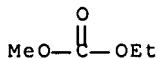
RN 107-31-3 HCPLUS
 CN Formic acid, methyl ester (CA INDEX NAME)



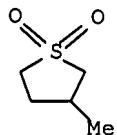
RN 126-33-0 HCPLUS
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



RN 872-93-5 HCPLUS
CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery mixed oxide manganese cathode;
graphite lithium doped anode battery; nonaq
electrolyte ethylene dimethyl carbonate; ethyl methyl carbonate
vinylene nonaq electrolyte
IT Secondary batteries
(lithium; secondary lithium batteries
with good cycle efficiency and durability)
IT Battery anodes
Battery cathodes
Battery electrolytes
(secondary lithium batteries with good cycle
efficiency and durability)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(Li-doped anode; secondary lithium batteries
with good cycle efficiency and durability)
IT 12057-17-9, Lithium manganese oxide (LiMn2O4)
RL: DEV (Device component use); USES (Uses)
(cathode; secondary lithium batteries with
good cycle efficiency and durability)
IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(doped in graphite; secondary lithium batteries
with good cycle efficiency and durability)
IT 7447-41-8, Lithium chloride, uses 7791-03-9, Lithium perchlorate
10377-51-2, Lithium iodide 14024-11-4, Lithium
tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate
18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium
hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
33454-82-9, Lithium trifluoromethanesulfonate 131651-65-5, Lithium
nonafluorobutanesulfonate
RL: DEV (Device component use); USES (Uses)

(electrolyte salt; secondary lithium batteries
with good cycle efficiency and durability)

IT 67-68-5, Dimethyl sulfoxide, uses 68-12-2,
N,N-Dimethylformamide, uses 75-05-8, Acetonitrile, uses 79-20-9,
Methyl acetate 96-47-9, 2-Methyltetrahydrofuran 96-48-0,
 γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8,
Diethyl carbonate 107-31-3, Methyl formate 108-29-2,
 γ -Valerolactone 108-32-7, Propylene carbonate 109-87-5,
Dimethoxymethane 109-99-9, Tetrahydrofuran, uses 110-71-4,
1,2-Dimethoxyethane 126-33-0, Sulfolane 127-19-5,
N,N-Dimethylacetamide 554-12-1, Methyl propionate 616-38-6,
Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
646-06-0, 1,3-Dioxolane 872-93-5, 3-Methylsulfolane
1072-47-5, 4-Methyl-1,3-dioxolane 4437-85-8, Butylene carbonate
19836-78-3

RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary
lithium batteries with good cycle efficiency
and durability)

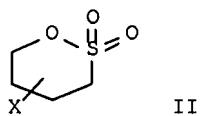
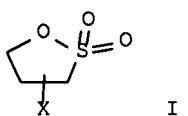
IT 872-36-6, Vinylene carbonate

RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(in nonaq. electrolyte; secondary lithium
batteries with good cycle efficiency and durability)

L58 ANSWER 2 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:118572 HCPLUS Full-text
DOCUMENT NUMBER: 140:149163
TITLE: Secondary batteries with nonaqueous electrolytes
INVENTOR(S): Saito, Midori; Komaru, Atsuo; Satori, Kotaro;
Inagaki, Naoko; Tanizaki, Hiroaki
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 32 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004047131	A	20040212	JP 2002-199068	200207 08
PRIORITY APPLN. INFO.:			JP 2002-199068	200207 08

OTHER SOURCE(S): MARPAT 140:149163
GI

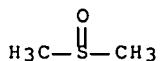


AB The battery comprises (A) a cathode, (B) an anode containing metals, alloys, elements, or their compds. that can form compds. with Li, and (C1) a nonaq. electrolyte containing ≥ 1 solvent(s) selected from a 1st solvent group, i.e. ethylene carbonate, fluoroethylene carbonate, propylene carbonate, butylene carbonate, γ -Bu lactone, and ethylene sulfite and ≥ 1 solvent(s) selected from a 2nd solvent group, i.e. di-Me carbonate, Me Et carbonate, di-Et carbonate, Me Pr carbonate, di-Pr carbonate, diisopropyl carbonate, DMSO, and di-Et sulfoxide or (C2) a nonaq. electrolyte containing ≥ 1 oxathiolane-2,2-dioxides I and II ($X = H, F, Cl, Br, Me, CH_2F, CHF_2, CF_3$). The batteries have high energy d. and show excellent charge-discharge cycles.

IT 67-68-5, Dimethyl sulfoxide, uses 70-29-1, Diethyl sulfoxide 623-53-0, Methyl ethyl carbonate 1120-71-4 1633-83-6 3741-38-6, Ethylene sulfite 652143-75-4 652143-82-3
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte; secondary lithium batteries with nonaq. electrolytes with cyclic solvents and noncyclic solvents)

RN 67-68-5 HCPLUS

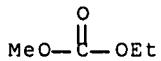
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



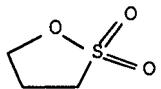
RN 70-29-1 HCPLUS
CN Ethane, 1,1'-sulfinylbis- (CA INDEX NAME)



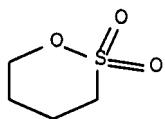
RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



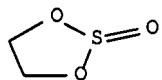
RN 1120-71-4 HCPLUS
CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



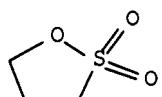
RN 1633-83-6 HCPLUS
CN 1,2-Oxathiane, 2,2-dioxide (CA INDEX NAME)



RN 3741-38-6 HCAPLUS
CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)

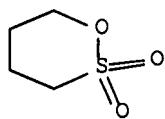


RN 652143-75-4 HCAPLUS
CN 1,2-Oxathiolane, methyl-, 2,2-dioxide (9CI) (CA INDEX NAME)



D1—Me

RN 652143-82-3 HCAPLUS
CN 1,2-Oxathiane, methyl-, 2,2-dioxide (9CI) (CA INDEX NAME)



D1—Me

IC ICM H01M010-40
IC S H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 27
ST secondary lithium battery nonaq electrolyte;
oxathiolanedioxide nonaq electrolyte secondary battery; carbonate
electrolyte nonaq secondary battery; propionate lithium salt nonaq
secondary battery
IT Secondary batteries
(lithium; secondary lithium batteries
with nonaq. electrolytes with cyclic solvents and noncyclic
solvents)

IT Battery electrolytes
 (nonaq.; secondary lithium batteries with
 nonaq. electrolytes with cyclic solvents and noncyclic solvents)
 IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 259750-80-6
 RL: DEV (Device component use); USES (Uses)
 (anode; secondary lithium batteries with
 nonaq. electrolytes with cyclic solvents and noncyclic solvents)
 IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); USES (Uses)
 (cathode; secondary lithium batteries with
 nonaq. electrolytes with cyclic solvents and noncyclic solvents)
 IT 67-68-5, Dimethyl sulfoxide, uses 70-29-1, Diethyl
 sulfoxide 96-48-0 96-49-1, Ethylene carbonate 105-37-3, Ethyl
 propionate 105-58-8, Diethyl carbonate 108-32-7, Propylene
 carbonate 554-12-1, Methyl propionate 616-38-6, Dimethyl
 carbonate 623-53-0, Methyl ethyl carbonate 623-96-1,
 Dipropyl carbonate 1120-71-4 1633-83-6
 3741-38-6, Ethylene sulfite 4437-85-8, Butylene carbonate
 6482-34-4, Diisopropyl carbonate 14283-07-9, Lithium
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
 56525-42-9, Methyl propyl carbonate, uses 114435-02-8,
 Fluoroethylene carbonate 652143-72-1 652143-73-2 652143-74-3
 652143-75-4 652143-76-5 652143-77-6 652143-78-7
 652143-79-8 652143-80-1 652143-81-2 652143-82-3
 652143-83-4 652143-84-5 652143-85-6
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte; secondary lithium
 batteries with nonaq. electrolytes with cyclic
 solvents and noncyclic solvents)

L58 ANSWER 3 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2003:488841 HCPLUS Full-text
 DOCUMENT NUMBER: 139:55432
 TITLE: Secondary nonaqueous battery with cathode
 containing carbon sulfide polymer
 INVENTOR(S): Nakai, Toshihiro; Zhao, Jin-Bao; Uenae,
 Keiichiro; Iizuka, Yoshiji; Nagai, Toru
 PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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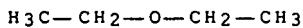
JP 2003178750	A	20030627	JP 2001-377197	200112 11
PRIORITY APPLN. INFO.:			JP 2001-377197	200112 11

OTHER SOURCE(S): MARPAT 139:55432
 AB The claimed battery is equipped with a cathode containing a poly(carbon sulfide)
 active mass layer formed on a current collector and a C-type conductive layer
 formed on the active mass layer. Preferably, the battery comprises an electrolyte

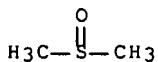
solution containing a S-containing compound solvent and/or an ethylene oxide-type solvent. The battery provides high capacity and long cycle life.

IT 60-29-7, Diethyl ether, uses 67-68-5, Dimethyl sulfoxide, uses 126-33-0, Sulfolan
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary nonaq. battery with cathode containing carbon sulfide polymer)

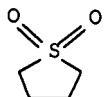
RN 60-29-7 HCAPLUS
CN Ethane, 1,1'-oxybis- (CA INDEX NAME)



RN 67-68-5 HCAPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



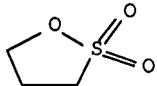
IC ICM H01M004-02
ICS H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Secondary batteries
(lithium; secondary nonaq. battery with
cathode containing carbon sulfide polymer)
IT 60-29-7, Diethyl ether, uses 67-68-5, Dimethyl sulfoxide, uses 96-47-9, 2-Methyl-tetrahydrofuran 109-99-9, Tetrahydrofuran, uses 126-33-0, Sulfolan 143-24-8, Tetraglyme 646-06-0, Dioxolane
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary nonaq. battery with cathode containing carbon sulfide polymer)

L58 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:433057 HCAPLUS Full-text
DOCUMENT NUMBER: 139:9306
TITLE: Secondary nonaqueous-electrolyte battery
with lithium titanium oxide anode
INVENTOR(S): Takahashi, Tadayoshi; Kawaguchi, Shinichi;
Koshiba, Tokiharu
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

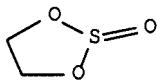
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003163029	A	20030606	JP 2001-360563	200111 27
PRIORITY APPLN. INFO.:		JP 2001-360563 200111 27		

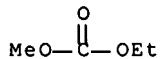
AB The claimed battery is equipped with an anode containing spinel-structure Li Ti oxide Li₄/3Ti₅/3O₄, a cathode showing Li ion-intercalation at ≥ 3 V (vsLi/Li⁺), and an electrolyte solution containing propane sultone and/or ethylene sulfite. The anode has high conductivity and the battery provides good high-load discharge characteristics.
IT 1120-71-4, Propane sultone 3741-38-6, Ethylene sulfite
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(electrolyte additive; secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)
RN 1120-71-4 HCAPLUS
CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



RN 3741-38-6 HCAPLUS
CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)



IT 623-53-0, Ethyl methyl carbonate
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)
RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium titanium oxide anode secondary battery; propane sultone
 ethylene sulfite electrolyte lithium secondary
 battery
 IT Secondary batteries
 (lithium; secondary nonaq.-electrolyte battery
 with lithium titanium oxide anode and sulfur compound
 additive)
 IT Battery anodes
 Battery electrolytes
 (secondary nonaq.-electrolyte battery with
 lithium titanium oxide anode and sulfur compound additive)
 IT 12031-95-7, Lithium titanium oxide (Li₄Ti₅O₁₂)
 RL: DEV (Device component use); USES (Uses)
 (anode; secondary nonaq.-electrolyte battery with
 lithium titanium oxide anode and sulfur compound additive)
 IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 RL: DEV (Device component use); USES (Uses)
 (cathode; secondary nonaq.-electrolyte battery with
 lithium titanium oxide anode and sulfur compound additive)
 IT 1120-71-4, Propane sultone 3741-38-6, Ethylene
 sulfite
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (electrolyte additive; secondary nonaq.-electrolyte
 battery with lithium titanium oxide anode and
 sulfur compound additive)
 IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl
 carbonate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solvent; secondary
 nonaq.-electrolyte battery with
 lithium titanium oxide anode and sulfur compound additive)

L58 ANSWER 5 OF 7 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2002:139093 HCPLUS Full-text
 DOCUMENT NUMBER: 136:203048
 TITLE: Nonaqueous electrolyte solutions containing
 phenylsulfonic acids and batteries
 INVENTOR(S): Hinohara, Akio; Ishida, Tatsuyoshi; Hirano,
 Chiho
 PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002056891	A	20020222	JP 2000-240850	

200008
09

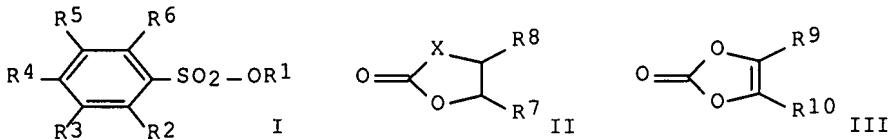
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PRIORITY APPLN. INFO.:

JP 2000-240850

OTHER SOURCE(S):
GI

MARPAT 136:203048

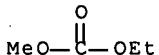


AB The electrolyte solns. contain phenylsulfonic acids I (R1 = H, metal; R2-6 = H, halogen, OH, sulfonic acid group, metal sulfonate, carboxylic acid group, metal carboxylate, C1-10 organic group). Preferably, the organic solvents contain cyclic esters II and/or linear carbonic acid esters III (R7-10 = H, C1-6 alkyl; X = O, CH2). Batteries comprising such electrolytes, e.g. secondary lithium batteries, are also claimed. Batteries with long cycle life are obtained.

IT 623-53-0, Methyl ethyl carbonate 30553-06-1,
Sulfonylbenzoic acid
RL: DEV (Device component use); USES (Uses)
(organic solvents containing phenylsulfonic acids as
electrolytes in batteries for long cycle
lifetime)

RN 623-53-0 HCPLUS

CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



RN 30553-06-1 HCPLUS

CN Benzoic acid, sulfo- (CA INDEX NAME)



D1-CO₂H

D1-SO₃H

IC ICM H01M010-40
ICS H01M004-02; H01M004-58

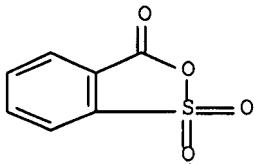
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 25, 27

ST battery nonaq electrolyte phenylsulfonic acid; org solvent
secondary lithium battery electrolyte;
cyclic ester battery nonaq electrolyte; carbonate ester battery
nonaq electrolyte
IT Secondary batteries
(lithium; organic solvents containing phenylsulfonic acids as
electrolytes in batteries for long cycle lifetime)
IT 96-49-1, Ethylene carbonate 623-53-0, Methyl ethyl
carbonate 28877-24-9 30553-06-1, Sulfobenzoic acid
400846-62-0
RL: DEV (Device component use); USES (Uses)
(organic solvents containing phenylsulfonic acids as
electrolytes in batteries for long cycle
lifetime)

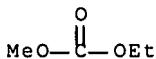
L58 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:27742 HCAPLUS Full-text
DOCUMENT NUMBER: 136:72342
TITLE: Nonaqueous-electrolyte solution and secondary
battery using it
INVENTOR(S): Hinohara, Akio
PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002008718	A	20020111	JP 2000-192566	200006 27
PRIORITY APPLN. INFO.:			JP 2000-192566	200006 27

OTHER SOURCE(S): MARPAT 136:72342
AB The solution consists of a nonaq. solvent containing an anhydride of sulfonic acid
and carboxylic acid R1SO3C(O)R2 (R1 and R2 = C1-10 organic group; R1 may be bonded
with R2). Optionally, the solution contains HF. A secondary battery containing
the above electrolyte solution is also claimed. The battery has good high-
temperature storage stability.
IT 81-08-3, o-Sulfobenzoic acid anhydride 623-53-0,
Methyl ethyl carbonate
RL: DEV (Device component use); USES (Uses)
(solvent; nonaq.-electrolyte solution containing sulfonic and
carboxylic anhydride for secondary battery)
RN 81-08-3 HCAPLUS
CN 3H-2,1-Benzoxathiol-3-one, 1,1-dioxide (CA INDEX NAME)



RN 623-53-0 HCAPLUS
 CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-02; H01M004-58; H01M006-16
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST sulfonic carboxylic acid anhydride nonaq electrolyte solvent
 secondary battery
 IT Secondary batteries
 (lithium; nonaq.-electrolyte solution containing sulfonic and
 carboxylic anhydride for secondary battery)
 IT 81-08-3, o-Sulfonylbenzoic acid anhydride 96-49-1, Ethylene
 carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene
 carbonate 616-38-6, Dimethyl carbonate 623-53-0, Methyl
 ethyl carbonate 872-36-6, Vinylene carbonate 4437-85-8, Butylene
 carbonate
 RL: DEV (Device component use); USES (Uses)
 (solvent; nonaq.-electrolyte solution containing sulfonic and
 carboxylic anhydride for secondary battery)

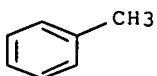
L58 ANSWER 7 OF 7 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 1987:480996 HCAPLUS Full-text
 DOCUMENT NUMBER: 107:80996
 TITLE: Nonaqueous electrochemical cell
 INVENTOR(S): Whitney, Thomas A.; Foster, Donald L.
 PATENT ASSIGNEE(S): Duracell, Inc., USA
 SOURCE: U.S., 6 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 4670363	A	19870602	US 1986-910694	198609 22
WO 8802188	A1	19880324	WO 1987-US2191	198708 31

W: AU, BR, DK, JP, KR

RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE

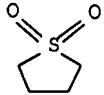
AU 8780375	A	19880407	AU 1987-80375		
				198708	
				31	
EP 282576	A1	19880921	EP 1987-906615		
				198708	
				31	
JP 01501026	T	19890406	JP 1987-506017		
				198708	
				31	
CA 1282825	C	19910409	CA 1987-547554		
				198709	
				22	
DK 8802823	A	19880707	DK 1988-2823		
				198805	
				24	
PRIORITY APPLN. INFO.:			US 1986-910694	A	
				198609	
				22	
			WO 1987-US2191	A	
				198708	
				31	
AB	An improved electrolyte for an alkali or alkaline earth metal battery comprises an alkali-metal or alkaline earth salt complexed with a monomeric or polymeric polyfunctional chelating tertiary amine containing ≥ 2 N atoms, a 1st solvent selected from aprotic aromatic organic solvents and their mixts., and a 2nd solvent selected from aprotic organic solvents having a dielec. constant $\epsilon \geq 20$ and their mixts. The 2nd solvent is present in an amount sufficient to increase the conductivity measured at 25° and 1 kHz to $\geq 10^{-3}/\Omega\text{-cm}$. The 1st solvent is selected from the group of C6H6, MePh, xylenes, pyridine, and N-methylpyrrole. The 2nd solvent is selected from the group of sulfolane, 3-methylsulfolane, and 3-methyl-2-oxazolidinone (I). The tertiary amine is selected from the group of pentamethyldiethylenetriamine (PMDT), tetramethylethylenediamine, tetramethylcyclohexanediamine, hexamethyltriethylenetetramine, and tris-(β - dimethylaminoethyl)amine, and their mixture. The resp. conductivities at 25° of 0.8 M LiI.PMDT in MePh, I, and 1:1 (volume) MePh-I were 1.3 + 10-5, 6.2 + 10-3, and 7.2 + 10-3/ $\Omega\text{-cm}$. High cycle lives of Li batteries having the invention electrolyte are also reported.				
IT	108-88-3, Toluene, uses and miscellaneous 110-86-1, Pyridine, uses and miscellaneous 126-33-0, Sulfolane				
RL: USES (Uses)	(electrolytes with solvent mixts. containing, conductivity of, for batteries)				
RN	108-88-3 HCPLUS				
CN	Benzene, methyl- (CA INDEX NAME)				



RN 110-86-1 HCPLUS
 CN Pyridine (CA INDEX NAME)



RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-14
INCL 429196000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST lithium battery nonaq electrolyte; iodide
lithium pentamethyldiethylenetriamine battery
electrolyte; toluene methyloxazolidinone battery electrolyte; elec
cond battery electrolyte
IT Batteries, secondary
(lithium, with electrolyte containing lithium salt
complexed with tertiary amines in organic solvent mixture)
IT 96-54-8, N-Methylpyrrole 108-32-7, Propylene carbonate
108-88-3, Toluene, uses and miscellaneous 110-86-1
, Pyridine, uses and miscellaneous 126-33-0, Sulfolane
646-06-0, Dioxolane 19836-78-3, 3-Methyl-2-oxazolidinone
RL: USES (Uses)
(electrolytes with solvent mixts. containing, conductivity of, for
batteries)

=> d 161 ibib abs hitstr hitind 1-4

L61 ANSWER 1 OF 4 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:84081 HCPLUS Full-text
DOCUMENT NUMBER: 136:137403
TITLE: Electrolyte for a lithium-
sulfur battery
INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok;
Lee, Jeawoan; Jung, Yongju; Kim, Joosoak
PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 7 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1176659	A2	20020130	EP 2001-117661	200107

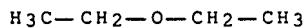
EP 1176659	A3	20060531		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
KR 2002008704	A	20020131	KR 2000-42736	
				200007
				25
KR 2002008705	A	20020131	KR 2000-42737	
				200007
				25
JP 2002075447	A	20020315	JP 2001-213435	
				200107
				13
US 2002102466	A1	20020801	US 2001-910952	
				200107
				24
CN 1335653	A	20020213	CN 2001-132526	
				200107
				25
PRIORITY APPLN. INFO.:			KR 2000-42736	A
				200007
				25
			KR 2000-42737	A
				200007
				25

AB An electrolyte for a lithium-sulfur battery has a solvent having a dielectric constant that is greater than or equal to 20, a solvent having a viscosity that is less than or equal to 1.3, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.

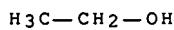
IT 60-29-7, Ethyl ether, uses 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 67-68-5, Dmso, uses 71-43-2, Benzene, uses 78-93-3, Methylethyl ketone, uses 107-31-3, Methyl formate 109-60-4, n-Propyl acetate 110-82-7, Cyclohexane, uses 110-86-1, Pyridine, uses 123-91-1, p-Dioxane, uses 126-33-0, Sulfolane 420-12-2, Ethylene sulfide 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 680-31-9, Hexamethylphosphoramide, uses 822-38-8, Ethylene trithiocarbonate 930-35-8, Vinylene trithiocarbonate 3741-38-6, Ethylene sulfite 25496-08-6, Fluorotoluene
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

RN 60-29-7 HCAPLUS

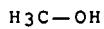
CN Ethane, 1,1'-oxybis- (CA INDEX NAME)



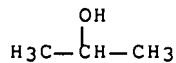
RN 64-17-5 HCAPLUS
CN Ethanol (CA INDEX NAME)



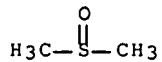
RN 67-56-1 HCAPLUS
CN Methanol (CA INDEX NAME)



RN 67-63-0 HCAPLUS
CN 2-Propanol (CA INDEX NAME)



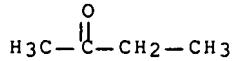
RN 67-68-5 HCAPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



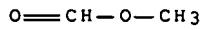
RN 71-43-2 HCAPLUS
CN Benzene (CA INDEX NAME)



RN 78-93-3 HCAPLUS
CN 2-Butanone (CA INDEX NAME)



RN 107-31-3 HCAPLUS
CN Formic acid, methyl ester (CA INDEX NAME)



RN 109-60-4 HCAPLUS
CN Acetic acid, propyl ester (CA INDEX NAME)

n-Pr-O-Ac

RN 110-82-7 HCPLUS
CN Cyclohexane (CA INDEX NAME)



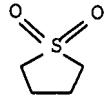
RN 110-86-1 HCPLUS
CN Pyridine (CA INDEX NAME)



RN 123-91-1 HCPLUS
CN 1,4-Dioxane (CA INDEX NAME)



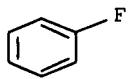
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



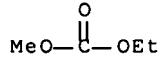
RN 420-12-2 HCPLUS
CN Thiirane (CA INDEX NAME)



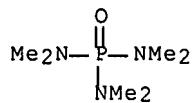
RN 462-06-6 HCPLUS
CN Benzene, fluoro- (CA INDEX NAME)



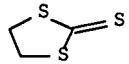
RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



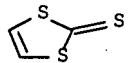
RN 680-31-9 HCPLUS
CN Phosphoric triamide, N,N,N',N',N'',N'''-hexamethyl- (CA INDEX NAME)



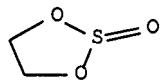
RN 822-38-8 HCPLUS
CN 1,3-Dithiolane-2-thione (CA INDEX NAME)



RN 930-35-8 HCPLUS
CN 1,3-Dithiole-2-thione (CA INDEX NAME)



RN 3741-38-6 HCPLUS
CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)



RN 25496-08-6 HCPLUS
CN Benzene, fluoromethyl- (CA INDEX NAME)



D1-F

D1-Me

IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
(electrolyte for lithium-sulfur
battery)
IT Secondary batteries
(lithium; electrolyte for lithium-
sulfur battery)
IT 60-29-7, Ethyl ether, uses 64-17-5, Ethanol, uses
67-56-1, Methanol, uses 67-63-0, Isopropanol, uses
67-68-5, Dmso, uses 68-12-2, Dmf, uses 71-43-2,
Benzene, uses 75-05-8, Acetonitrile, uses 78-93-3,
Methylethyl ketone, uses 79-20-9, Methyl acetate 96-47-9,
2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone 96-49-1,
Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl
carbonate 107-31-3, Methyl formate 108-32-7, Propylene
carbonate 109-60-4, n-Propyl acetate 109-99-9, Thf, uses
110-71-4, 1,2-Dimethoxyethane 110-82-7, Cyclohexane, uses
110-86-1, Pyridine, uses 111-96-6, Diglyme
123-91-1, p-Dioxane, uses 126-33-0, Sulfolane
141-78-6, Ethyl acetate, uses 420-12-2, Ethylene sulfide
462-06-6, Fluorobenzene 554-12-1, Methyl propionate
616-38-6, Dimethyl carbonate 623-53-0, Ethylmethyl
carbonate 646-06-0, 1,3-Dioxolane 680-31-9,
Hexamethylphosphoramide, uses 822-38-8, Ethylene
trithiocarbonate 872-36-6, Vinylene carbonate 930-35-8,
Vinylene trithiocarbonate 3741-38-6, Ethylene sulfite
7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate
14283-07-9, Lithium tetrafluoroborate 16508-95-5, Bismuth
carbonate 21324-40-3, Lithium hexafluorophosphate
25496-08-6, Fluorotoluene 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium triflate 74432-42-1,
Lithium polysulfide 90076-65-6
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

L61 ANSWER 2 OF 4 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:84080 HCPLUS Full-text
DOCUMENT NUMBER: 136:137402
TITLE: Electrolyte for a lithium-
sulfur battery
INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok;
Lee, Jeawoan; Jung, Yongju; Kim, Joosoak
PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 11 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1176658	A2	20020130	EP 2001-117642	200107 24
EP 1176658	A3	20060531	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR	
KR 2002008703	A	20020131	KR 2000-42735	200007 25
KR 2002014196	A	20020225	KR 2000-47348	200008 17
JP 2002083633	A	20020322	JP 2001-213414	200107 13
US 2002045101	A1	20020418	US 2001-911083	200107 24
US 6852450	B2	20050208		
CN 1335652	A	20020213	CN 2001-132525	200107 25
PRIORITY APPLN. INFO.:			KR 2000-42735	A
				200007 25
			KR 2000-47348	A
				200008 17

AB An electrolyte for a lithium-sulfur battery includes a first component solvent with a sulfur solubility more than or equal to 20 mM, a second component solvent with a sulfur solubility less than 20 mM, a third component solvent with a high dielec. constant and a high viscosity, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.

IT 64-17-5, Ethanol, uses 67-63-0, Isopropanol, uses 71-43-2, Benzene, uses 108-88-3, Toluene, uses 109-60-4, Propyl acetate 110-82-7, Cyclohexane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur battery)

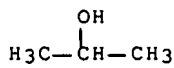
RN 64-17-5 HCPLUS

CN Ethanol (CA INDEX NAME)

H₃C—CH₂—OH

RN 67-63-0 HCPLUS

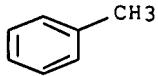
CN 2-Propanol (CA INDEX NAME)



RN 71-43-2 HCPLUS
CN Benzene (CA INDEX NAME)



RN 108-88-3 HCPLUS
CN Benzene, methyl- (CA INDEX NAME)



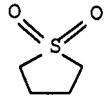
RN 109-60-4 HCPLUS
CN Acetic acid, propyl ester (CA INDEX NAME)

n-Pr-O-Ac

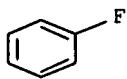
RN 110-82-7 HCPLUS
CN Cyclohexane (CA INDEX NAME)



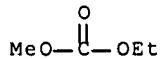
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 462-06-6 HCPLUS
CN Benzene, fluoro- (CA INDEX NAME)



RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
(electrolyte for lithium-sulfur
battery)
IT Secondary batteries
(lithium; electrolyte for lithium-
sulfur battery)
IT Synthetic polymeric fibers, uses
RL: DEV (Device component use); USES (Uses)
(polysulfides, carbon-polysulfur polymer; electrolyte for
lithium-sulfur battery)
IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)
IT 7440-44-0, Super P, uses
RL: MOA (Modifier or additive use); USES (Uses)
(activated; electrolyte for lithium-sulfur
battery)
IT 64-17-5, Ethanol, uses 67-63-0, Isopropanol, uses
71-43-2, Benzene, uses 79-20-9, Methyl acetate 96-47-9,
2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone 96-49-1,
Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl
carbonate 108-32-7, Propylene carbonate 108-88-3,
Toluene, uses 108-94-1, Cyclohexanone, uses 109-60-4,
Propyl acetate 109-99-9, Thf, uses 110-71-4 110-82-7,
Cyclohexane, uses 111-96-6, Diglyme 126-33-0, Sulfolane
141-78-6, Ethyl acetate, uses 143-24-8, Tetraglyme
462-06-6, Fluorobenzene 554-12-1, Methyl propionate
616-38-6, Dimethyl carbonate 623-53-0, Ethylmethyl
carbonate 646-06-0, 1,3-Dioxolane 1330-20-7, Xylene, uses
7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 7704-34-9D,
Sulfur, organic compound 7791-03-9, Lithium perchlorate 14283-07-9,
Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
27359-10-0, Trifluorotoluene 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9,
Methylpropyl carbonate, uses 74432-42-1, Lithium polysulfide
90076-65-6
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)
IT 124-38-9, Carbon dioxide, uses 7446-09-5, Sulfur dioxide, uses

9003-20-7, Polyvinyl acetate 10024-97-2, Nitrous oxide, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte for lithium-sulfur
 battery)

L61 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2000:141485 HCAPLUS Full-text
 DOCUMENT NUMBER: 132:168757
 TITLE: Liquid electrolyte lithium-
 sulfur batteries
 INVENTOR(S): Chu, May-Ying; De Jonghe, Lutgard C.; Visco,
 Steven J.; Katz, Bruce D.
 PATENT ASSIGNEE(S): Polyplus Battery Co., Inc., USA
 SOURCE: U.S., 28 pp., Cont.-in-part of U.S. 5,686,201
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 15
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6030720	A	20000229	US 1997-948969	199710 10
US 5523179	A	19960604	US 1994-344384	199411 23
US 5582623	A	19961210	US 1995-479687	199506 07
US 5686201	A	19971111	US 1996-686609	199607 26
CA 2305454	A1	19990422	CA 1998-2305454	199810 06
WO 9919931	A1	19990422	WO 1998-US21067	199810 06
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 9896876	A	19990503	AU 1998-96876	199810 06
AU 741815	B2	20011213		
EP 1021849	A1	20000726	EP 1998-950967	199810 06
EP 1021849	B1	20030122		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9812749	A	20000829	BR 1998-12749	

JP 2001520447	T	20011030	JP 2000-516392	199810 06
AT 231653	T	20030215	AT 1998-950967	199810 06
US 6358643	B1	20020319	US 2000-495639	199810 06
PRIORITY APPLN. INFO.:			US 1994-344384	200002 01
			US 1994-344384	199411 23
			US 1995-479687	A2 199506 07
			US 1996-686609	A2 199607 26
			US 1997-948969	A 199710 10
			WO 1998-US21067	W 199810 06

OTHER SOURCE(S): MARPAT 132:168757

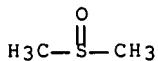
AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH₂CH₂O)_nR2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH₂CH₂O)_n form a closed ring. Examples of linear solvents include the glymes (CH₃O(CH₂CH₂)_nCH₃). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 67-56-1, Methanol, uses 67-68-5,
Dimethylsulfoxide, uses 110-86-1, Pyridine, uses 680-31-9, Hexamethylphosphoramide, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

RN 67-56-1 HCAPLUS

CN Methanol (CA INDEX NAME)

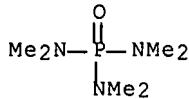
RN 67-68-5 HCAPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 110-86-1 HCAPLUS
CN Pyridine (CA INDEX NAME)



RN 680-31-9 HCAPLUS
CN Phosphoric triamide, N,N,N',N',N'',N'''-hexamethyl- (CA INDEX NAME)



IC ICM H01M010-40
INCL 429105000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery lithium sulfur liq electrolyte
IT Battery electrolytes
Conducting polymers
(liquid electrolyte lithium-sulfur
batteries)
IT Carbon black, uses
Polyoxyalkylenes, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Alcohols, uses
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Crown ethers
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Cryptands
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)

(liquid electrolyte lithium-sulfur batteries)

IT Glycols, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT Secondary batteries
(lithium; liquid electrolyte lithium-sulfur batteries)

IT Intercalation compounds
RL: DEV (Device component use); USES (Uses)
(lithium; liquid electrolyte lithium-sulfur batteries)

IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7440-23-5, Sodium, uses 7704-34-9, Sulfur, uses 90076-65-6
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 25322-68-3, Polyethylene oxide
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 67-56-1, Methanol, uses 67-68-5,
Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 75-52-5, Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses 107-21-1, Ethylene glycol, uses 110-60-1, Tetramethylenediamine 110-86-1, Pyridine, uses 110-95-2, Tetramethylpropylenediamine 126-73-8, Tributylphosphate, uses 127-19-5, N,N-Dimethylacetamide 143-24-8, Tetraglyme 294-93-9, 12-Crown-4 512-56-1, Trimethylphosphate 617-84-5, N,N-Diethylformamide 632-22-4, Tetramethylurea 680-31-9, Hexamethylphosphoramide, uses 685-91-6, N,N-Diethylacetamide 1493-13-6, Trifluoromethanesulfonic acid 2832-49-7, N,N,N',N'-Tetraethylsulfamide 3030-47-5, Pentamethyldiethylenetriamine 7446-09-5, Sulfur dioxide, uses 7637-07-2, Boron trifluoride, uses 14187-32-7, Dibenzo 18-crown-6 17455-13-9, 18-Crown-6 33100-27-5, 15-Crown-5
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L61 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:271600 HCAPLUS Full-text
DOCUMENT NUMBER: 130:284490
TITLE: Liquid electrolyte lithium-sulfur batteries
INVENTOR(S): Chu, May-Ying; De Jonghe, Lutgard C.; Visco, Steven J.; Katz, Bruce D.
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA

SOURCE: PCT Int. Appl., 57 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 15

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9919931	A1	19990422	WO 1998-US21067	199810 06
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6030720	A	20000229	US 1997-948969	199710 10
CA 2305454	A1	19990422	CA 1998-2305454	199810 06
AU 9896876	A	19990503	AU 1998-96876	199810 06
AU 741815	B2	20011213		
EP 1021849	A1	20000726	EP 1998-950967	199810 06
EP 1021849	B1	20030122		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9812749	A	20000829	BR 1998-12749	199810 06
JP 2001520447	T	20011030	JP 2000-516392	199810 06
AT 231653	T	20030215	AT 1998-950967	199810 06
PRIORITY APPLN. INFO.:			US 1997-948969	A 199710 10
			US 1994-344384	A2 199411 23
			US 1995-479687	A2 199506 07
			US 1996-686609	A2 199607

WO 1998-US21067

W

199810
06

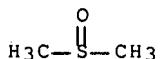
OTHER SOURCE(S): MARPAT 130:284490

AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH2CH2O)nR2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH2CH2O)n form a closed ring. Examples of linear solvents include the glymes (CH3O(CH2CH2)nCH3). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 67-56-1, Methanol, uses 67-68-5,
 Dimethylsulfoxide, uses 110-86-1, Pyridine, uses
 680-31-9, Hexamethylphosphoramide, uses
 RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)
 (liquid electrolyte lithium-sulfur
 batteries)
 RN 67-56-1 HCAPLUS
 CN Methanol (CA INDEX NAME)

H3C-OH

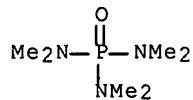
RN 67-68-5 HCAPLUS
 CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 110-86-1 HCAPLUS
 CN Pyridine (CA INDEX NAME)



RN 680-31-9 HCAPLUS
 CN Phosphoric triamide, N,N,N',N',N'',N'''-hexamethyl- (CA INDEX NAME)



IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST electrolyte solvent lithium sulfur
battery
 IT Battery cathodes
 Battery electrolytes
 Secondary batteries
 (liquid electrolyte lithium-sulfur
 batteries)
 IT Alcohols, uses
 Carbon black, uses
 Carbon fibers, uses
 Glycols, uses
 Polyoxyalkylenes, uses
 Polysulfides
 Sulfides, uses
 RL: DEV (Device component use); USES (Uses)
 (liquid electrolyte lithium-sulfur
 batteries)
 IT Crown ethers
 RL: MOA (Modifier or additive use); USES (Uses)
 (liquid electrolyte lithium-sulfur
 batteries)
 IT Cryptands
 RL: MOA (Modifier or additive use); USES (Uses)
 (liquid electrolyte lithium-sulfur
 batteries)
 IT 143-24-8, Tetraethyleneglycol dimethyl ether 7439-93-2, Lithium,
 uses 7439-93-2D, Lithium, intercalation compound, uses 7440-23-5,
 Sodium, uses 7440-44-0, Carbon, uses 7704-34-9, Sulfur, uses
 7791-03-9, Lithium perchlorate 14283-07-9, Lithium
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
 25322-68-3, Peo 29935-35-1, Lithium hexafluoroarsenate
 33454-82-9, Lithium triflate 74432-42-1, Lithium polysulfide
 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (liquid electrolyte lithium-sulfur
 batteries)
 IT 67-56-1, Methanol, uses 67-68-5,
 Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses
 75-52-5, Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses
 107-21-1, Ethylene glycol, uses 110-60-1, Tetramethylenediamine
 110-86-1, Pyridine, uses 110-95-2,
 Tetramethylpropylenediamine 126-73-8, Tributylphosphate, uses
 127-19-5, N,N-Dimethylacetamide 512-56-1, Trimethylphosphate
 617-84-5, N,N-Diethylformamide 632-22-4, Tetramethylurea
 680-31-9, Hexamethylphosphoramide, uses 685-91-6,
 N,N-Diethylacetamide 1493-13-6, Trifluoromethanesulfonic acid
 1822-45-3, Tetramethylpropylenediamine 2832-49-7,
 N,N,N',N'-Tetraethylsulfamide 3030-47-5,
 Pentamethyldiethylenetriamine. 7446-09-5, Sulfur dioxide, uses
 7637-07-2, Boron trifluoride, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

IT 294-93-9, 12-Crown-4 14187-32-7, Dibenzo-18-crown-6 17455-13-9,
18-Crown-6 33100-27-5, 15-Crown-5

RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur batteries)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d 162 ibib abs hitstr hitind 1-14

L62 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:544098 HCAPLUS Full-text
DOCUMENT NUMBER: 145:30918
TITLE: Electrolyte for lithium-sulfur batteries
INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena
PATENT ASSIGNEE(S): Oxis Energy Ltd., UK
SOURCE: PCT Int. Appl., 24 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006059085	A1	20060608	WO 2005-GB4572	200511 29
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
GB 2420907	A	20060607	GB 2005-4290	200503 02
GB 2420907	B	20060913		
EP 1815546	A1	20070808	EP 2005-818427	200511 29
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR				
PRIORITY APPLN. INFO.:			RU 2004-135236	A 200412

02

GB 2005-4290

A
200503
02

US 2005-657436P

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200503
02

WO 2005-GB4572

W
200511
29

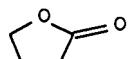
AB An electrolyte for a lithium-sulfur battery, the electrolyte comprising a solution of at least one electrolyte salt in at least two aprotic solvents. The components of the solution are selected so that the solution is eutectic or close to eutectic. Also disclosed is a lithium-sulfur battery including such an electrolyte. By using a eutectic mixture, the performance of the electrolyte and the battery at low temps. is much improved.

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 109-60-4, Propyl acetate 126-33-0, Sulfolane 623-53-0, Ethyl methyl carbonate 917-73-7 1003-78-7, 2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone 7560-59-0, Methylbutylsulfone

RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur batteries)

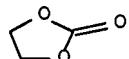
RN 96-48-0 HCPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



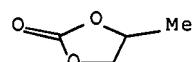
RN 96-49-1 HCPLUS

CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 108-32-7 HCPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)

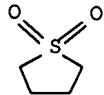


RN 109-60-4 HCPLUS

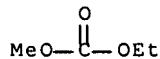
CN Acetic acid, propyl ester (CA INDEX NAME)

n-Pr—O—Ac

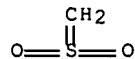
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



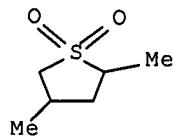
RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



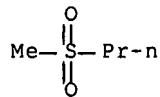
RN 917-73-7 HCPLUS
CN Methanethial, S,S-dioxide (9CI) (CA INDEX NAME)



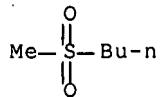
RN 1003-78-7 HCPLUS
CN Thiophene, tetrahydro-2,4-dimethyl-, 1,1-dioxide (CA INDEX NAME)



RN 1977-37-3 HCPLUS
CN Propane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



RN 7560-59-0 HCPLUS
CN Butane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST electrolyte lithium sulfur battery
 IT Battery electrolytes
 (electrolyte for lithium-sulfur
 batteries)
 IT Sulfones
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
 IT Amines, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
 IT Secondary batteries
 (lithium; electrolyte for lithium-
 sulfur batteries)
 IT Lithium alloy, base
 RL: TEM (Technical or engineered material use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
 IT 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran
 96-48-0, γ -Butyrolactone 96-49-1, Ethylene
 carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate
 108-32-7, Propylene carbonate 109-60-4, Propyl
 acetate 109-99-9, Thf, uses 110-71-4 111-96-6, Diglyme
 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses
 143-24-8, Tetraglyme 554-12-1, Methyl propionate 616-38-6,
 Dimethyl carbonate 623-53-0, Ethyl methyl carbonate
 646-06-0, 1,3-Dioxolane 917-73-7 1003-78-7,
 2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone
 7439-93-2, Lithium, uses 7560-59-0, Methylbutylsulfone
 7791-03-9, Lithium perchlorate 12136-58-2, Lithium sulfide
 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium
 hexafluoroarsenate 56525-42-9, Methyl propyl carbonate, uses
 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)
 IT 7446-09-5, Sulfur dioxide, uses 7553-56-2, Iodine, uses
 7704-34-9, Sulfur, uses 7726-95-6, Bromine, uses 7782-50-5,
 Chlorine, uses 10024-97-2, Nitrous oxide, uses 74432-42-1,
 Lithium polysulfide
 RL: MOA (Modifier or additive use); USES (Uses)
 (electrolyte for lithium-sulfur
 batteries)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE
 FOR THIS RECORD. ALL CITATIONS AVAILABLE
 IN THE RE FORMAT

DOCUMENT NUMBER: 145:11315
 TITLE: Electrolyte for lithium-sulfur
 batteries and lithium
 sulfur batteries using the
 same
 INVENTOR(S): Kolosnitsyn, Vladimir; Karaseva, Elena
 PATENT ASSIGNEE(S): Oxis Energy Limited, UK; Intellikraft Limited
 SOURCE: Brit. UK Pat. Appl., 23 pp.
 CODEN: BAXXDU
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

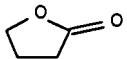
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
GB 2420907	A	20060607	GB 2005-4290	200503 02
GB 2420907	B	20060913		
WO 2006059085	A1	20060608	WO 2005-GB4572	200511 29
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
EP 1815546	A1	20070808	EP 2005-818427	200511 29
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR				
US 2006121355	A1	20060608	US 2005-290825	200512 01
PRIORITY APPLN. INFO.: RU 2004-135236 A 200412 02				
GB 2005-4290 A 200503 02				
US 2005-657436P P 200503 02				
WO 2005-GB4572 W 200511 29				

AB An electrolyte for a lithium-sulfur battery comprises a solution of ≥ 1 electrolyte salt in ≥ 2 aprotic solvents. The components of the solution are selected so that the solution is eutectic or close to eutectic. Also disclosed is a lithium-sulfur battery including such an electrolyte. By using a eutectic mixture, the performance of the electrolyte and the battery at low temps. is much improved.

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 109-60-4, Propylacetate 126-33-0, Sulfolane 623-53-0, Ethylmethylcarbonate 1003-78-7, 2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone 7560-59-0, Methylbutylsulfone 31124-38-6, Ethylbutylsulfone
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(lithium sulfur battery electrolytes)

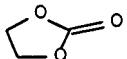
RN 96-48-0 HCPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



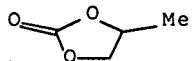
RN 96-49-1 HCPLUS

CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 108-32-7 HCPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



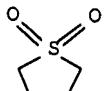
RN 109-60-4 HCPLUS

CN Acetic acid, propyl ester (CA INDEX NAME)

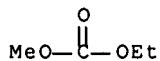


RN 126-33-0 HCPLUS

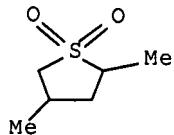
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



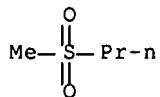
RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



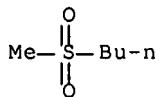
RN 1003-78-7 HCAPLUS
CN Thiophene, tetrahydro-2,4-dimethyl-, 1,1-dioxide (CA INDEX NAME)



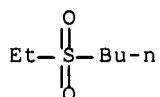
RN 1977-37-3 HCAPLUS
CN Propane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



RN 7560-59-0 HCAPLUS
CN Butane, 1-(methylsulfonyl)- (9CI) (CA INDEX NAME)



RN 31124-38-6 HCAPLUS
CN Butane, 1-(ethylsulfonyl)- (9CI) (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST lithium sulfur battery electrolyte
IT Battery electrolytes
Eutectics
(lithium sulfur battery
electrolytes)
IT Amines, uses
Carbon black, uses
Polyoxyalkylenes, uses
Sulfones
RL: NUU (Other use, unclassified); TEM (Technical or engineered
material use); USES (Uses)
(lithium sulfur battery
electrolytes)
IT Lithium alloy, base
RL: NUU (Other use, unclassified); TEM (Technical or engineered
material use); USES (Uses)
(lithium sulfur battery
electrolytes)
IT 79-20-9, Methylacetate 96-47-9, 2-Methyltetrahydrofuran
96-48-0, γ -Butyrolactone 96-49-1, Ethylene
carbonate 105-37-3, Ethylpropionate 105-58-8, Diethylcarbonate
108-32-7, Propylene carbonate 109-60-4,
Propylacetate 109-99-9, THF, uses 110-71-4 111-96-6, Diglyme
124-38-9, Carbon dioxide, uses 126-33-0, Sulfolane
141-78-6, Ethylacetate, uses 143-24-8, Tetraglyme 554-12-1,
Methylpropionate 616-38-6, Dimethylcarbonate 623-53-0,
Ethylmethylcarbonate 646-06-0, 1,3-Dioxolane 1003-78-7,
2,4-Dimethylsulfolane 1977-37-3, Methylpropylsulfone
7439-93-2D, Lithium, derivs. 7446-09-5, Sulfur dioxide, uses
7560-59-0, Methylbutylsulfone 7704-34-9D, Sulfur,
derivs./polymers 7782-50-5, Chlorine, uses 7791-03-9, Lithium
perchlorate 10024-97-2, Dinitrogen oxide, uses 18496-25-8,
Sulfide 20461-54-5, Iodide, uses 21324-40-3, Lithium
hexafluorophosphate 24959-67-9, Bromide, uses 25322-68-3,
Polyethylene oxide 29935-35-1, Lithium hexafluoroarsenate
31124-38-6, Ethylbutylsulfone 33454-82-9, Lithium
trifluoromethane sulfonate 39448-96-9 56525-42-9,
Methylpropylcarbonate, uses 74432-42-1, Lithium sulfide (Li₂(Sx))
90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide
RL: NUU (Other use, unclassified); TEM (Technical or engineered
material use); USES (Uses)
(lithium sulfur battery
electrolytes)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS RECORD. ALL CITATIONS AVAILABLE IN
THE RE FORMAT

L62 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1129877 HCAPLUS Full-text
DOCUMENT NUMBER: 143:408181
TITLE: Secondary lithium batteries
with good cycle efficiency and durability
INVENTOR(S): Imasaka, Koji; Fujioka, Yuichi; Hashimoto,
Tsutomu; Tajima, Hidehiko; Adachi, Kazuyuki;
Shibata, Hiroyuki; Kai, Masaaki
PATENT ASSIGNEE(S): Mitsubishi Heavy Industries, Ltd., Japan; Kyushu
Electric Power Co., Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

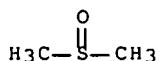
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2005294028	A	20051020	JP 2004-107291	200403 31
PRIORITY APPLN. INFO.:			JP 2004-107291	200403 31

AB The batteries contain Li-containing mixed oxides as cathode active mass, Li-doped graphite as anode active mass, and nonaq. electrolytes, and show terminal potential of discharge against Li \leq 0.5 V.

IT 67-68-5, Dimethyl sulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 75-05-8, Acetonitrile, uses 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 126-33-0, Sulfolane 623-53-0, Ethyl methyl carbonate 872-93-5, 3-Methylsulfolane
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary lithium batteries with good cycle efficiency and durability)

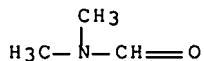
RN 67-68-5 HCAPLUS

CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



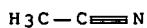
RN 68-12-2 HCAPLUS

CN Formamide, N,N-dimethyl- (CA INDEX NAME)



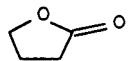
RN 75-05-8 HCAPLUS

CN Acetonitrile (CA INDEX NAME)

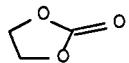


RN 96-48-0 HCAPLUS

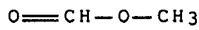
CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



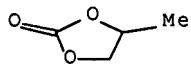
RN 96-49-1 HCAPLUS
CN 1,3-Dioxolan-2-one (CA INDEX NAME)



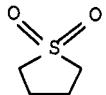
RN 107-31-3 HCAPLUS
CN Formic acid, methyl ester (CA INDEX NAME)



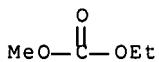
RN 108-32-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



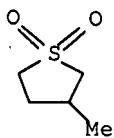
RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



RN 872-93-5 HCAPLUS
CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery mixed oxide manganese cathode;
 graphite lithium doped anode battery; nonaq
 electrolyte ethylene dimethyl carbonate; ethyl methyl carbonate
 vinylene nonaq electrolyte
 IT Secondary batteries
 (lithium; secondary lithium batteries
 with good cycle efficiency and durability)
 IT Battery anodes
 Battery cathodes
 Battery electrolytes
 (secondary lithium batteries with good cycle
 efficiency and durability)
 IT 7782-42-5, Graphite, uses
 RL: DEV (Device component use); USES (Uses)
 (Li-doped anode; secondary lithium batteries
 with good cycle efficiency and durability)
 IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄)
 RL: DEV (Device component use); USES (Uses)
 (cathode; secondary lithium batteries with
 good cycle efficiency and durability)
 IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (doped in graphite; secondary lithium batteries
 with good cycle efficiency and durability)
 IT 7447-41-8, Lithium chloride, uses 7791-03-9, Lithium perchlorate
 10377-51-2, Lithium iodide 14024-11-4, Lithium
 tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate
 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium
 hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
 33454-82-9, Lithium trifluoromethanesulfonate 131651-65-5, Lithium
 nonafluorobutanesulfonate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte salt; secondary lithium batteries
 with good cycle efficiency and durability)
 IT 67-68-5, Dimethyl sulfoxide, uses 68-12-2,
 N,N-Dimethylformamide, uses 75-05-8, Acetonitrile, uses
 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran
 96-48-0, γ -Butyrolactone 96-49-1, Ethylene
 carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl
 formate 108-29-2, γ -Valerolactone 108-32-7,
 Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9,
 Tetrahydrofuran, uses 110-71-4, 1,2-Dimethoxyethane
 126-33-0, Sulfolane 127-19-5, N,N-Dimethylacetamide
 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate
 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane
 872-93-5, 3-Methylsulfolane 1072-47-5,
 4-Methyl-1,3-dioxolane 4437-85-8, Butylene carbonate 19836-78-3

RL: DEV (Device component use); USES (Uses)
 (electrolyte solvent; secondary
 lithium batteries with good cycle efficiency
 and durability)

IT 872-36-6, Vinylene carbonate
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (in nonaq. electrolyte; secondary lithium
 batteries with good cycle efficiency and durability)

L62 ANSWER 4 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2004:402981 HCPLUS Full-text
 DOCUMENT NUMBER: 140:409628
 TITLE: Organic electrolytic solution for
 lithium battery
 INVENTOR(S): Kim, Ju-Yup; Ryu, Young-Gyo; Cho, Myung-Dong
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
 SOURCE: Eur. Pat. Appl., 19 pp.
 CODEN: EPXXDW
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1420474	A1	20040519	EP 2003-254063	200306 26
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004043045	A	20040522	KR 2002-71043	200211 15
US 2004096749	A1	20040520	US 2003-601907	200306 24
CN 1501540	A	20040602	CN 2003-148467	200306 30
JP 2004172117	A	20040617	JP 2003-382538	200311 12
PRIORITY APPLN. INFO.:			KR 2002-71043	A 200211 15

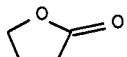
OTHER SOURCE(S): MARPAT 140:409628
 AB An organic electrolytic solution containing a lithium salt, an organic solvent, and an oxalate compound, and a lithium battery using the organic electrolytic solution are provided. Due to the oxalate compound, the organic electrolytic solution stabilizes lithium metal and improves the conductivity of lithium ions. Also,, the organic electrolytic solution present invention improves charging/discharging efficiency when used in lithium batteries having a lithium metal anode. Especially when the organic electrolytic solution is used in lithium sulfur batteries, the oxalate compound forms a chelate with lithium ions and improves the ionic conductivity and the charging/discharging efficiency of the battery. In addition, due to the chelation of the lithium ions, neg. sulfur ions

remain free without interaction with lithium ions, are highly likely to dissolve in an electrolytic solution. As a result, a reversible capacity of sulfur is improved.

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 126-33-0, Sulfolane 623-53-0, Ethyl methyl carbonate
RL: DEV (Device component use); USES (Uses)
(organic electrolytic solution for lithium battery)

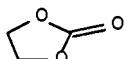
RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



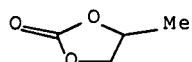
RN 96-49-1 HCAPLUS

CN 1,3-Dioxolan-2-one (CA INDEX NAME)



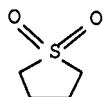
RN 108-32-7 HCAPLUS

CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



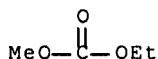
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 623-53-0 HCAPLUS

CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium battery org electrolyte soln

IT Secondary batteries
 (lithium; organic electrolytic solution for lithium battery)

IT Battery electrolytes
 (organic electrolytic solution for lithium battery)

IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (organic electrolytic solution for lithium battery)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 110-71-4 111-96-6, Diethylene glycol dimethyl ether 112-36-7, Diethylene glycol diethyl ether 112-49-2, Triethylene glycol dimethyl ether 126-33-0, Sulfolane 463-79-6D, Carbonic acid, ester 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, Dioxolane 872-36-6, Vinylene carbonate 1072-47-5, 1,3-Dioxolane, 4-methyl 1072-57-7, 1,3-Dioxolane, 4,5-dimethyl 4499-99-4, Triethylene glycol diethyl ether 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses 12137-46-1, Kasolite 29921-38-8, 1,3-Dioxolane, 4-ethyl 31371-55-8, Ethane, 1,2-dimethoxy-homopolymer 73506-93-1, Diethoxyethane 183140-14-9, 1,3-Dioxetan-2-one 676610-04-1, 1,3-Dioxolane, 4,5-diethyl RL: DEV (Device component use); USES (Uses)
 (organic electrolytic solution for lithium battery)

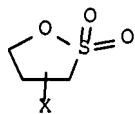
IT 95-92-1, Diethyl oxalate 338-70-5, uses 553-90-2, Dimethyl oxalate 615-98-5, Dipropyl oxalate 2050-60-4, Dibutyloxalate 7704-34-9D, Sulfur, organic compds. 18241-31-1, Bis(4-methylbenzyl)oxalate 74432-42-1, Lithium polysulfide RL: MOA (Modifier or additive use); USES (Uses)
 (organic electrolytic solution for lithium battery)

L62 ANSWER 5 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN
 ACCESSION NUMBER: 2004:118572 HCPLUS Full-text
 DOCUMENT NUMBER: 140:149163
 TITLE: Secondary batteries with nonaqueous electrolytes
 INVENTOR(S): Saito, Midori; Komaru, Atsuo; Satori, Kotaro; Inagaki, Naoko; Tanizaki, Hiroaki
 PATENT ASSIGNEE(S): Sony Corp., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 32 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

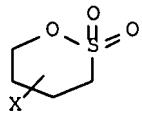
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2004047131	A	20040212	JP 2002-199068	200207 08
PRIORITY APPLN. INFO.:			JP 2002-199068	200207 08

OTHER SOURCE(S): MARPAT 140:149163
 GI



I



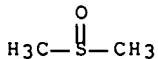
II

AB The battery comprises (A) a cathode, (B) an anode containing metals, alloys, elements, or their compds. that can form compds. with Li, and (C1) a nonaq. electrolyte containing ≥ 1 solvent(s) selected from a 1st solvent group, i.e. ethylene carbonate, fluoroethylene carbonate, propylene carbonate, butylene carbonate, γ -Bu lactone, and ethylene sulfite and ≥ 1 solvent(s) selected from a 2nd solvent group, i.e. di-Me carbonate, Me Et carbonate, di-Et carbonate, Me Pr carbonate, di-Pr carbonate, diisopropyl carbonate, DMSO, and di-Et sulfoxide or (C2) a nonaq. electrolyte containing ≥ 1 oxathiolane-2,2-dioxides I and II (X = H, F, Cl, Br, Me, CH₂F, CHF₂, CF₃). The batteries have high energy d. and show excellent charge-discharge cycles.

IT 67-68-5, Dimethyl sulfoxide, uses 70-29-1, Diethyl sulfoxide 96-48-0 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 623-53-0, Methyl ethyl carbonate 1120-71-4 1633-83-6 3741-38-6, Ethylene sulfite 652143-75-4 652143-82-3
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte; secondary lithium batteries with nonaq. electrolytes with cyclic solvents and noncyclic solvents)

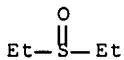
RN 67-68-5 HCPLUS

CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



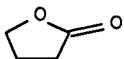
RN 70-29-1 HCPLUS

CN Ethane, 1,1'-sulfinylbis- (CA INDEX NAME)



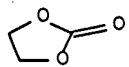
RN 96-48-0 HCPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)

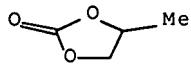


RN 96-49-1 HCPLUS

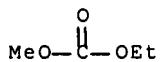
CN 1,3-Dioxolan-2-one (CA INDEX NAME)



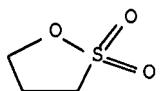
RN 108-32-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



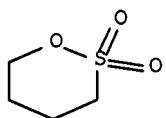
RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



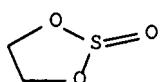
RN 1120-71-4 HCAPLUS
CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



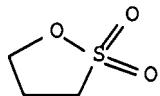
RN 1633-83-6 HCAPLUS
CN 1,2-Oxathiane, 2,2-dioxide (CA INDEX NAME)



RN 3741-38-6 HCAPLUS
CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)

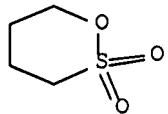


RN 652143-75-4 HCAPLUS
CN 1,2-Oxathiolane, methyl-, 2,2-dioxide (9CI) (CA INDEX NAME)



D1—Me

RN 652143-82-3 HCPLUS
CN 1,2-Oxathiane, methyl-, 2,2-dioxide (9CI) (CA INDEX NAME)



D1—Me

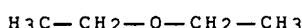
IC ICM H01M010-40
ICS H01M004-38
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 27
ST secondary lithium battery nonaq electrolyte;
oxathiolanedioxide nonaq electrolyte secondary battery; carbonate
electrolyte nonaq secondary battery; propionate lithium salt nonaq
secondary battery
IT Secondary batteries
(lithium; secondary lithium batteries
with nonaq. electrolytes with cyclic solvents and noncyclic
solvents)
IT Battery electrolytes
(nonaq.; secondary lithium batteries with
nonaq. electrolytes with cyclic solvents and noncyclic solvents)
IT 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 259750-80-6
RL: DEV (Device component use); USES (Uses)
(anode; secondary lithium batteries with
nonaq. electrolytes with cyclic solvents and noncyclic solvents)
IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
RL: DEV (Device component use); USES (Uses)
(cathode; secondary lithium batteries with
nonaq. electrolytes with cyclic solvents and noncyclic solvents)
IT 67-68-5, Dimethyl sulfoxide, uses 70-29-1, Diethyl
sulfoxide 96-48-0 96-49-1, Ethylene carbonate
105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 554-12-1, Methyl propionate
616-38-6, Dimethyl carbonate 623-53-0, Methyl ethyl
carbonate 623-96-1, Dipropyl carbonate 1120-71-4
1633-83-6 3741-38-6, Ethylene sulfite 4437-85-8,
Butylene carbonate 6482-34-4, Diisopropyl carbonate 14283-07-9,
Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
56525-42-9, Methyl propyl carbonate, uses 114435-02-8,
Fluoroethylene carbonate 652143-72-1 652143-73-2 652143-74-3
652143-75-4 652143-76-5 652143-77-6 652143-78-7
652143-79-8 652143-80-1 652143-81-2 652143-82-3

652143-83-4 652143-84-5 652143-85-6
RL: DEV (Device component use); USES (Uses)
(nonaq. electrolyte; secondary lithium
batteries with nonaq. electrolytes with cyclic
solvents and noncyclic solvents)

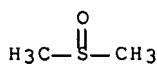
L62 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:488841 HCAPLUS Full-text
DOCUMENT NUMBER: 139:55432
TITLE: Secondary nonaqueous battery with cathode
containing carbon sulfide polymer
INVENTOR(S): Nakai, Toshihiro; Zhao, Jin-Bao; Uenae,
Keiichiro; Iizuka, Yoshiji; Nagai, Toru
PATENT ASSIGNEE(S): Hitachi Maxell Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003178750	A	20030627	JP 2001-377197	200112 11
PRIORITY APPLN. INFO.:			JP 2001-377197	200112 11

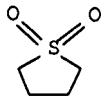
OTHER SOURCE(S): MARPAT 139:55432
AB The claimed battery is equipped with a cathode containing a poly(carbon sulfide) active mass layer formed on a current collector and a C-type conductive layer formed on the active mass layer. Preferably, the battery comprises an electrolyte solution containing a S-containing compound solvent and/or an ethylene oxide-type solvent. The battery provides high capacity and long cycle life.
IT 60-29-7, Diethyl ether, uses 67-68-5, Dimethyl sulfoxide, uses 126-33-0, Sulfolan
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary
nonaq. battery with cathode containing carbon sulfide
polymer)
RN 60-29-7 HCAPLUS
CN Ethane, 1,1'-oxybis- (CA INDEX NAME)



RN 67-68-5 HCAPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M004-02
ICS H01M004-58; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Secondary batteries
(lithium; secondary nonaq. battery with
cathode containing carbon sulfide polymer)
IT 60-29-7, Diethyl ether, uses 67-68-5, Dimethyl
sulfoxide, uses 96-47-9, 2-Methyl-tetrahydrofuran 109-99-9,
Tetrahydrofuran, uses 126-33-0, Sulfolan 143-24-8,
Tetraglyme 646-06-0, Dioxolane
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary
nonaq. battery with cathode containing carbon sulfide
polymer)

L62 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:433057 HCAPLUS Full-text
DOCUMENT NUMBER: 139:9306
TITLE: Secondary nonaqueous-electrolyte battery
with lithium titanium oxide anode
INVENTOR(S): Takahashi, Tadayoshi; Kawaguchi, Shinichi;
Koshiba, Tokiharu
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

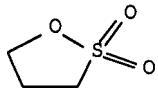
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003163029	A	20030606	JP 2001-360563	200111 27
PRIORITY APPLN. INFO.:			JP 2001-360563	200111 27

AB The claimed battery is equipped with an anode containing spinel-structure Li Ti oxide Li₄/3Ti₅/3O₄, a cathode showing Li ion-intercalation at ≥ 3 V (vsLi/Li⁺), and an electrolyte solution containing propane sultone and/or ethylene sulfite. The anode has high conductivity and the battery provides good high-load discharge characteristics.
IT 1120-71-4, Propane sultone 3741-38-6, Ethylene sulfite
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(electrolyte additive; secondary nonaq.-electrolyte
battery with lithium titanium oxide anode and
sulfur compound additive)

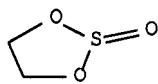
RN 1120-71-4 HCPLUS

CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



RN 3741-38-6 HCPLUS

CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)

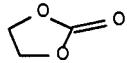


IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl
carbonate

RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary
nonaq.-electrolyte battery with
lithium titanium oxide anode and sulfur compound additive)

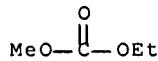
RN 96-49-1 HCPLUS

CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 623-53-0 HCPLUS

CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium titanium oxide anode secondary battery; propane sultone
ethylene sulfite electrolyte lithium secondary
battery

IT Secondary batteries

(lithium; secondary nonaq.-electrolyte battery
with lithium titanium oxide anode and sulfur compound
additive)

IT Battery anodes

Battery electrolytes

(secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)

IT 12031-95-7, Lithium titanium oxide (Li₄Ti₅O₁₂)
RL: DEV (Device component use); USES (Uses)
(anode; secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
RL: DEV (Device component use); USES (Uses)
(cathode; secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)

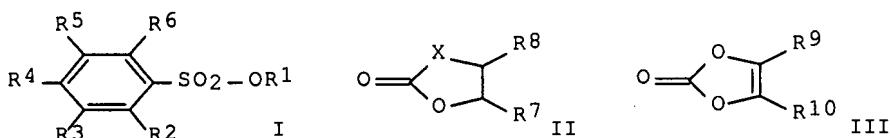
IT 1120-71-4, Propane sultone 3741-38-6, Ethylene sulfite
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(electrolyte additive; secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)

IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; secondary nonaq.-electrolyte battery with lithium titanium oxide anode and sulfur compound additive)

L62 ANSWER 8 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:139093 HCPLUS Full-text
DOCUMENT NUMBER: 136:203048
TITLE: Nonaqueous electrolyte solutions containing
phenylsulfonic acids and batteries
INVENTOR(S): Hinohara, Akio; Ishida, Tatsuyoshi; Hirano,
Chiho
PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002056891	A	20020222	JP 2000-240850	20000809
PRIORITY APPLN. INFO.:			JP 2000-240850	20000809

OTHER SOURCE(S) : MARPAT 136:203048
GI



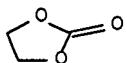
AB The electrolyte solns. contain phenylsulfonic acids I (R1 = H, metal; R2-6 = H, halogen, OH, sulfonic acid group, metal sulfonate, carboxylic acid group, metal carboxylate, C1-10 organic group). Preferably, the organic solvents contain cyclic esters II and/or linear carbonic acid esters III (R7-10 = H, C1-6 alkyl; X = O, CH2). Batteries comprising such electrolytes, e.g. secondary lithium batteries, are also claimed. Batteries with long cycle life are obtained.

IT 96-49-1, Ethylene carbonate 623-53-0, Methyl ethyl carbonate 30553-06-1, Sulfo benzoic acid

RL: DEV (Device component use); USES (Uses)
(organic solvents containing phenylsulfonic acids as electrolytes in batteries for long cycle lifetime)

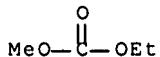
RN 96-49-1 HCPLUS

CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 623-53-0 HCPLUS

CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



RN 30553-06-1 HCPLUS

CN Benzoic acid, sulfo- (CA INDEX NAME)



D1-CO₂H

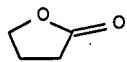
D1-SO₃H

IT 96-48-0, γ -Butyrolactone 108-32-7, Propylene carbonate

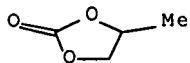
RL: TEM (Technical or engineered material use); USES (Uses)
(organic solvents containing phenylsulfonic acids as electrolytes in batteries for long cycle lifetime)

RN 96-48-0 HCPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 108-32-7 HCPLUS
CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 25, 27
ST battery nonaq electrolyte phenylsulfonic acid; org solvent
secondary lithium battery electrolyte;
cyclic ester battery nonaq electrolyte; carbonate ester battery
nonaq electrolyte
IT Secondary batteries
(lithium; organic solvents containing phenylsulfonic acids as
electrolytes in batteries for long cycle lifetime)
IT 96-49-1, Ethylene carbonate 623-53-0, Methyl ethyl
carbonate 28877-24-9 30553-06-1, Sulfobenzoic acid
400846-62-0
RL: DEV (Device component use); USES (Uses)
(organic solvents containing phenylsulfonic acids as
electrolytes in batteries for long cycle
lifetime)
IT 96-48-0, γ -Butyrolactone 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate
872-36-6, Vinylene carbonate 4437-85-8, Butylene carbonate
RL: TEM (Technical or engineered material use); USES (Uses)
(organic solvents containing phenylsulfonic acids as
electrolytes in batteries for long cycle lifetime)

L62 ANSWER 9 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:84081 HCPLUS Full-text
DOCUMENT NUMBER: 136:137403
TITLE: Electrolyte for a lithium-
sulfur battery
INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok;
Lee, Jeawoan; Jung, Yongju; Kim, Joosoak
PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea
SOURCE: Eur. Pat. Appl., 7 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1176659	A2	20020130	EP 2001-117661	200107 25
EP 1176659	A3	20060531		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				

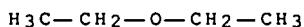
KR 2002008704	A	20020131	KR 2000-42736	
				200007
				25
KR 2002008705	A	20020131	KR 2000-42737	
				200007
				25
JP 2002075447	A	20020315	JP 2001-213435	
				200107
				13
US 2002102466	A1	20020801	US 2001-910952	
				200107
				24
CN 1335653	A	20020213	CN 2001-132526	
				200107
				25
PRIORITY APPLN. INFO.:			KR 2000-42736	A
				200007
				25
			KR 2000-42737	A
				200007
				25

AB An electrolyte for a lithium-sulfur battery has a solvent having a dielectric constant that is greater than or equal to 20, a solvent having a viscosity that is less than or equal to 1.3, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.

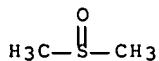
IT 60-29-7, Ethyl ether, uses 67-68-5, Dmso, uses 68-12-2, Dmf, uses 71-43-2, Benzene, uses 75-05-8, Acetonitrile, uses 78-93-3, Methylethyl ketone, uses 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-60-4, n-Propyl acetate 110-82-7, Cyclohexane, uses 110-86-1, Pyridine, uses 123-91-1, p-Dioxane, uses 126-33-0, Sulfolane 420-12-2, Ethylene sulfide 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate 822-38-8, Ethylene trithiocarbonate 930-35-8, Vinylene trithiocarbonate 3741-38-6, Ethylene sulfite 25496-08-6, Fluorotoluene
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur battery)

RN 60-29-7 HCAPLUS

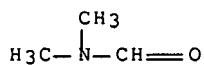
CN Ethane, 1,1'-oxybis- (CA INDEX NAME)



RN 67-68-5 HCAPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



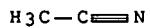
RN 68-12-2 HCAPLUS
CN Formamide, N,N-dimethyl- (CA INDEX NAME)



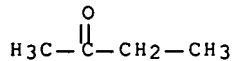
RN 71-43-2 HCAPLUS
CN Benzene (CA INDEX NAME)



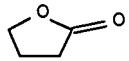
RN 75-05-8 HCAPLUS
CN Acetonitrile (CA INDEX NAME)



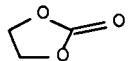
RN 78-93-3 HCAPLUS
CN 2-Butanone (CA INDEX NAME)



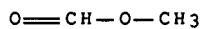
RN 96-48-0 HCAPLUS
CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



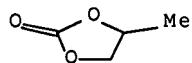
RN 96-49-1 HCAPLUS
CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 107-31-3 HCAPLUS
CN Formic acid, methyl ester (CA INDEX NAME)



RN 108-32-7 HCPLUS
CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



RN 109-60-4 HCPLUS
CN Acetic acid, propyl ester (CA INDEX NAME)



RN 110-82-7 HCPLUS
CN Cyclohexane (CA INDEX NAME)



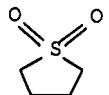
RN 110-86-1 HCPLUS
CN Pyridine (CA INDEX NAME)



RN 123-91-1 HCPLUS
CN 1,4-Dioxane (CA INDEX NAME)



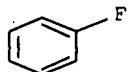
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



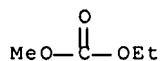
RN 420-12-2 HCAPLUS
CN Thirane (CA INDEX NAME)



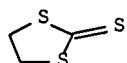
RN 462-06-6 HCAPLUS
CN Benzene, fluoro- (CA INDEX NAME)



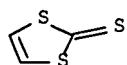
RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



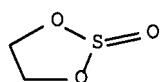
RN 822-38-8 HCAPLUS
CN 1,3-Dithiolane-2-thione (CA INDEX NAME)



RN 930-35-8 HCAPLUS
CN 1,3-Dithiole-2-thione (CA INDEX NAME)



RN 3741-38-6 HCAPLUS
CN 1,3,2-Dioxathiolane, 2-oxide (CA INDEX NAME)



RN 25496-08-6 HCAPLUS

CN Benzene, fluoromethyl- (CA INDEX NAME)



D1-F

D1-Me

IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
(electrolyte for lithium-sulfur
battery)
IT Secondary batteries
(lithium; electrolyte for lithium-
sulfur battery)
IT 60-29-7, Ethyl ether, uses 64-17-5, Ethanol, uses
67-56-1, Methanol, uses 67-63-0, Isopropanol, uses 67-68-5
, Dmso, uses 68-12-2, Dmf, uses 71-43-2,
Benzene, uses 75-05-8, Acetonitrile, uses 78-93-3
, Methyl ethyl ketone, uses 79-20-9, Methyl acetate 96-47-9,
2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone
96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate
105-58-8, Diethyl carbonate 107-31-3, Methyl formate
108-32-7, Propylene carbonate 109-60-4, n-Propyl
acetate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane
110-82-7, Cyclohexane, uses 110-86-1, Pyridine,
uses 111-96-6, Diglyme 123-91-1, p-Dioxane, uses
126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses
420-12-2, Ethylene sulfide 462-06-6, Fluorobenzene
554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate
623-53-0, Ethylmethyl carbonate 646-06-0, 1,3-Dioxolane
680-31-9, Hexamethylphosphoramide, uses 822-38-8, Ethylene
trithiocarbonate 872-36-6, Vinylene carbonate 930-35-8,
Vinylene trithiocarbonate 3741-38-6, Ethylene sulfite
7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate
14283-07-9, Lithium tetrafluoroborate 16508-95-5, Bismuth
carbonate 21324-40-3, Lithium hexafluorophosphate
25496-08-6, Fluorotoluene 29935-35-1, Lithium
hexafluoroarsenate 33454-82-9, Lithium triflate 74432-42-1,
Lithium polysulfide 90076-65-6
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

L62 ANSWER 10 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:84080 HCPLUS Full-text

DOCUMENT NUMBER: 136:137402

TITLE: Electrolyte for a lithium-
sulfur battery

INVENTOR(S): Hwang, Duckchul; Choi, Yunsuk; Choi, Sooseok;
Lee, Jeawoan; Jung, Yongju; Kim, Joosoak

PATENT ASSIGNEE(S): Samsung SDI Co. Ltd., S. Korea

SOURCE: Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1176658	A2	20020130	EP 2001-117642	200107 24
EP 1176658	A3	20060531	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR	
KR 2002008703	A	20020131	KR 2000-42735	200007 25
KR 2002014196	A	20020225	KR 2000-47348	200008 17
JP 2002083633	A	20020322	JP 2001-213414	200107 13
US 2002045101	A1	20020418	US 2001-911083	200107 24
US 6852450	B2	20050208		200107 25
CN 1335652	A	20020213	CN 2001-132525	
PRIORITY APPLN. INFO.:			KR 2000-42735	A
				200007 25
			KR 2000-47348	A
				200008 17

AB An electrolyte for a lithium-sulfur battery includes a first component solvent with a sulfur solubility more than or equal to 20 mM, a second component solvent with a sulfur solubility less than 20 mM, a third component solvent with a high dielec. constant and a high viscosity, and an electrolyte salt. This battery shows excellent capacity and cycle life characteristics.

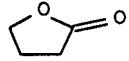
IT 71-43-2, Benzene, uses 96-48-0,
γ-Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses 109-60-4, Propyl acetate 110-82-7, Cyclohexane, uses 126-33-0, Sulfolane 462-06-6, Fluorobenzene 623-53-0, Ethylmethyl carbonate RL: DEV (Device component use); USES (Uses) (electrolyte for lithium-sulfur battery)

RN 71-43-2 HCAPIUS

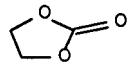
CN Benzene (CA INDEX NAME)



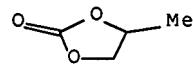
RN 96-48-0 HCAPLUS
CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



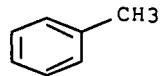
RN 96-49-1 HCAPLUS
CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 108-32-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



RN 108-88-3 HCAPLUS
CN Benzene, methyl- (CA INDEX NAME)



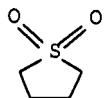
RN 109-60-4 HCAPLUS
CN Acetic acid, propyl ester (CA INDEX NAME)



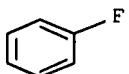
RN 110-82-7 HCAPLUS
CN Cyclohexane (CA INDEX NAME)



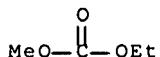
RN 126-33-0 HCPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 462-06-6 HCPLUS
CN Benzene, fluoro- (CA INDEX NAME)



RN 623-53-0 HCPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte lithium sulfur battery
IT Battery electrolytes
 (electrolyte for lithium-sulfur
 battery)
IT Secondary batteries
 (lithium; electrolyte for lithium-
 sulfur battery)
IT Synthetic polymeric fibers, uses
 RL: DEV (Device component use); USES (Uses)
 (polysulfides, carbon-polysulfur polymer; electrolyte for
 lithium-sulfur battery)
IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (electrolyte for lithium-sulfur
 battery)
IT 7440-44-0, Super P, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (activated; electrolyte for lithium-sulfur
 battery)
IT 64-17-5, Ethanol, uses 67-63-0, Isopropanol, uses 71-43-2
 , Benzene, uses 79-20-9, Methyl acetate 96-47-9,
 2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone
 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate
 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate
 108-88-3, Toluene, uses 108-94-1, Cyclohexanone, uses
 109-60-4, Propyl acetate 109-99-9, Thf, uses 110-71-4

110-82-7, Cyclohexane, uses 111-96-6, Diglyme
126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses
143-24-8, Tetraglyme 462-06-6, Fluorobenzene 554-12-1,
Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0,
Ethylmethyl carbonate 646-06-0, 1,3-Dioxolane 1330-20-7, Xylene,
uses 7439-93-2, Lithium, uses 7704-34-9, Sulfur, uses
7704-34-9D, Sulfur, organic compound 7791-03-9, Lithium perchlorate
14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium
hexafluorophosphate 27359-10-0, Trifluorotoluene 29935-35-1,
Lithium hexafluoroarsenate 33454-82-9, Lithium triflate
56525-42-9, Methylpropyl carbonate, uses 74432-42-1, Lithium
polysulfide 90076-65-6
RL: DEV (Device component use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

IT 124-38-9, Carbon dioxide, uses 7446-09-5, Sulfur dioxide, uses
9003-20-7, Polyvinyl acetate 10024-97-2, Nitrous oxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(electrolyte for lithium-sulfur
battery)

L62 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:27742 HCAPLUS Full-text
DOCUMENT NUMBER: 136:72342
TITLE: Nonaqueous-electrolyte solution and secondary
battery using it
INVENTOR(S): Hinohara, Akio
PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

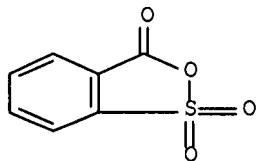
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002008718	A	20020111	JP 2000-192566	200006 27
PRIORITY APPLN. INFO.:			JP 2000-192566	200006 27

OTHER SOURCE(S): MARPAT 136:72342

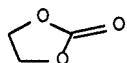
AB The solution consists of a nonaq. solvent containing an anhydride of sulfonic acid and carboxylic acid R1SO3C(O)R2 (R1 and R2 = C1-10 organic group; R1 may be bonded with R2). Optionally, the solution contains HF. A secondary battery containing the above electrolyte solution is also claimed. The battery has good high-temperature storage stability.

IT 81-08-3, o-Sulfobenzoic acid anhydride 96-49-1,
Ethylene carbonate 108-32-7, Propylene carbonate
623-53-0, Methyl ethyl carbonate
RL: DEV (Device component use); USES (Uses)
(solvent; nonaq.-electrolyte solution containing sulfonic and
carboxylic anhydride for secondary battery)

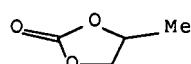
RN 81-08-3 HCAPLUS
CN 3H-2,1-Benzoxathiol-3-one, 1,1-dioxide (CA INDEX NAME)



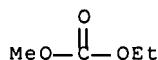
RN 96-49-1 HCAPLUS
CN 1,3-Dioxolan-2-one (CA INDEX NAME)



RN 108-32-7 HCAPLUS
CN 1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)



RN 623-53-0 HCAPLUS
CN Carbonic acid, ethyl methyl ester (CA INDEX NAME)



IC ICM H01M010-40
IC S H01M004-02; H01M004-58; H01M006-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST sulfonic carboxylic acid anhydride nonaq electrolyte solvent
secondary battery
IT Secondary batteries
(lithium; nonaq.-electrolyte solution containing sulfonic and
carboxylic anhydride for secondary battery)
IT 81-08-3, o-Sulfobenzoic acid anhydride 96-49-1,
Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7,
Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0
, Methyl ethyl carbonate 872-36-6, Vinylene carbonate 4437-85-8,
Butylene carbonate
RL: DEV (Device component use); USES (Uses)
(solvent; nonaq.-electrolyte solution containing sulfonic and
carboxylic anhydride for secondary battery)

L62 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:141485 HCAPLUS Full-text
DOCUMENT NUMBER: 132:168757
TITLE: Liquid electrolyte lithium-
sulfur batteries

INVENTOR(S): Chu, May-Ying; De Jonghe, Lutgard C.; Visco,
 Steven J.; Katz, Bruce D.
 PATENT ASSIGNEE(S): Polyplus Battery Co., Inc., USA
 SOURCE: U.S., 28 pp., Cont.-in-part of U.S. 5,686,201
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 15
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6030720	A	20000229	US 1997-948969	199710 10
US 5523179	A	19960604	US 1994-344384	199411 23
US 5582623	A	19961210	US 1995-479687	199506 07
US 5686201	A	19971111	US 1996-686609	199607 26
CA 2305454	A1	19990422	CA 1998-2305454	199810 06
WO 9919931	A1	19990422	WO 1998-US21067	199810 06
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
AU 9896876	A	19990503	AU 1998-96876	199810 06
AU 741815	B2	20011213		
EP 1021849	A1	20000726	EP 1998-950967	199810 06
EP 1021849	B1	20030122		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9812749	A	20000829	BR 1998-12749	199810 06
JP 2001520447	T	20011030	JP 2000-516392	199810 06
AT 231653	T	20030215	AT 1998-950967	199810 06
US 6358643	B1	20020319	US 2000-495639	200002

PRIORITY APPLN. INFO.:	US 1994-344384	A2	01
			199411
			23
	US 1995-479687	A2	199506
			07
	US 1996-686609	A2	199607
			26
	US 1997-948969	A	199710
			10
	WO 1998-US21067	W	199810
			06

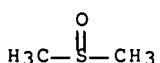
OTHER SOURCE(S): MARPAT 132:168757

AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH2CH2O)nR2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH2CH2O)n form a closed ring. Examples of linear solvents include the glymes (CH3O(CH2CH2)nCH3). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

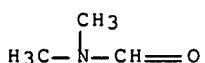
IT 67-68-5, Dimethylsulfoxide, uses 68-12-2,
 N,N-Dimethylformamide, uses 110-86-1, Pyridine, uses
 RL: DEV (Device component use); TEM (Technical or engineered
 material use); USES (Uses)
 (liquid electrolyte lithium-sulfur
 batteries)

RN 67-68-5 HCPLUS

CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 68-12-2 HCPLUS
 CN Formamide, N,N-dimethyl- (CA INDEX NAME)



RN 110-86-1 HCPLUS
CN Pyridine (CA INDEX NAME)



IC ICM H01M010-40.
INCL 429105000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST battery lithium sulfur liq electrolyte
IT Battery electrolytes
Conducting polymers
(liquid electrolyte lithium-sulfur
batteries)
IT Carbon black, uses
Polyoxyalkylenes, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Alcohols, uses
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Crown ethers
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Cryptands
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Glycols, uses
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Secondary batteries
(lithium; liquid electrolyte lithium-
sulfur batteries)
IT Intercalation compounds
RL: DEV (Device component use); USES (Uses)
(lithium; liquid electrolyte lithium-sulfur
batteries)
IT 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation
compound, uses 7440-23-5, Sodium, uses 7704-34-9, Sulfur, uses
90076-65-6
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT 25322-68-3, Polyethylene oxide
RL: DEV (Device component use); MOA (Modifier or additive use); USES

(Uses)

(liquid electrolyte lithium-sulfur
batteries)

IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses
68-12-2, N,N-Dimethylformamide, uses 75-52-5,
Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses 107-21-1,
Ethylene glycol, uses 110-60-1, Tetramethylenediamine
110-86-1, Pyridine, uses 110-95-2,
Tetramethylpropylenediamine 126-73-8, Tributylphosphate, uses
127-19-5, N,N-Dimethylacetamide 143-24-8, Tetraglyme 294-93-9,
12-Crown-4 512-56-1, Trimethylphosphate 617-84-5,
N,N-Diethylformamide 632-22-4, Tetramethylurea 680-31-9,
Hexamethylphosphoramide, uses 685-91-6, N,N-Diethylacetamide
1493-13-6, Trifluoromethanesulfonic acid 2832-49-7,
N,N,N',N'-Tetraethylsulfamide 3030-47-5,
Pentamethyldiethylenetriamine 7446-09-5, Sulfur dioxide, uses
7637-07-2, Boron trifluoride, uses 14187-32-7, Dibenzo 18-crown-6
17455-13-9, 18-Crown-6 33100-27-5, 15-Crown-5
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)

(liquid electrolyte lithium-sulfur
batteries)

IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)

(liquid electrolyte lithium-sulfur
batteries)

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE
FOR THIS RECORD. ALL CITATIONS AVAILABLE
IN THE RE FORMAT

L62 ANSWER 13 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1999:271600 HCPLUS Full-text
DOCUMENT NUMBER: 130:284490
TITLE: Liquid electrolyte lithium-
sulfur batteries
INVENTOR(S): Chu, May-Ying; De Jonghe, Lutgard C.; Visco, ,
Steven J.; Katz, Bruce D.
PATENT ASSIGNEE(S): Polyplus Battery Company, Inc., USA
SOURCE: PCT Int. Appl., 57 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 15
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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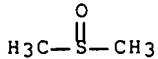
WO 9919931	A1	19990422	WO 1998-US21067	199810 06
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US 6030720	A	20000229	US 1997-948969	

CA 2305454	A1	19990422	CA 1998-2305454	199710 10
AU 9896876	A	19990503	AU 1998-96876	199810 06
AU 741815	B2	20011213		199810 06
EP 1021849	A1	20000726	EP 1998-950967	199810 06
EP 1021849	B1	20030122		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
BR 9812749	A	20000829	BR 1998-12749	199810 06
JP 2001520447	T	20011030	JP 2000-516392	199810 06
AT 231653	T	20030215	AT 1998-950967	199810 06
PRIORITY APPLN. INFO.:			US 1997-948969	A 199710 10
			US 1994-344384	A2 199411 23
			US 1995-479687	A2 199506 07
			US 1996-686609	A2 199607 26
			WO 1998-US21067	W 199810 06

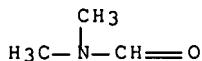
OTHER SOURCE(S): MARPAT 130:284490

AB Disclosed are electrolyte solvents for ambient-temperature lithium-sulfur batteries. The disclosed solvents include at least one ethoxy repeating unit compound of the general formula R1(CH₂CH₂O)_nR2, where n ranges between 2 and 10 and R1 and R2 are different or identical alkyl or alkoxy groups (including substituted alkyl or alkoxy groups). Alternatively, R1 and R2 may together with (CH₂CH₂O)_n form a closed ring. Examples of linear solvents include the glymes (CH₃O(CH₂CH₂)_nCH₃). Some electrolyte solvents include a donor or acceptor solvent in addition to an ethoxy compound as described. Examples of donor solvents include hexamethylphosphoramide, pyridine, N,N-diethylacetamide, N,N-diethylformamide, dimethylsulfoxide, tetramethylurea, N,N-dimethylacetamide, N,N-dimethylformamide, tributylphosphate, trimethylphosphate, N,N,N',N'-tetraethylsulfamide, tetramethylenediamine, tetramethylpropylenediamine, and pentamethyldiethylenetriamine. These assist in solvation of lithium ions. Examples of acceptor solvents include alcs., glycols, and polyglycols. These assist in solvation of the sulfide and polysulfide anions.

IT 67-68-5, Dimethylsulfoxide, uses 68-12-2,
N,N-Dimethylformamide, uses 110-86-1, Pyridine, uses
RL: DEV (Device component use); TEM (Technical or engineered
material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
RN 67-68-5 HCPLUS
CN Methane, 1,1'-sulfinylbis- (CA INDEX NAME)



RN 68-12-2 HCPLUS
CN Formamide, N,N-dimethyl- (CA INDEX NAME)



RN 110-86-1 HCPLUS
CN Pyridine (CA INDEX NAME)



IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte solvent lithium sulfur
battery
IT Battery cathodes
Battery electrolytes
Secondary batteries
(liquid electrolyte lithium-sulfur
batteries)
IT Alcohols, uses
Carbon black, uses
Carbon fibers, uses
Glycols, uses
Polyoxyalkylenes, uses
Polysulfides
Sulfides, uses
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Crown ethers
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)
IT Cryptands
RL: MOA (Modifier or additive use); USES (Uses)

(liquid electrolyte lithium-sulfur
batteries)

IT 143-24-8, Tetraethyleneglycol dimethyl ether 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compound, uses 7440-23-5, Sodium, uses 7440-44-0, Carbon, uses 7704-34-9, Sulfur, uses 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 25322-68-3, Peo 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 74432-42-1, Lithium polysulfide 90076-65-6
RL: DEV (Device component use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

IT 67-56-1, Methanol, uses 67-68-5, Dimethylsulfoxide, uses 68-12-2, N,N-Dimethylformamide, uses 75-52-5, Nitromethane, uses 76-05-1, Trifluoroacetic acid, uses 107-21-1, Ethylene glycol, uses 110-60-1, Tetramethylenediamine 110-86-1, Pyridine, uses 110-95-2, Tetramethylpropylenediamine 126-73-8, Tributylphosphate, uses 127-19-5, N,N-Dimethylacetamide 512-56-1, Trimethylphosphate 617-84-5, N,N-Diethylformamide 632-22-4, Tetramethylurea 680-31-9, Hexamethylphosphoramide, uses 685-91-6, N,N-Diethylacetamide 1493-13-6, Trifluoromethanesulfonic acid 1822-45-3, Tetramethylpropylenediamine 2832-49-7, N,N,N',N'-Tetraethylsulfamide 3030-47-5, Pentamethyldiethylenetriamine. 7446-09-5, Sulfur dioxide, uses 7637-07-2, Boron trifluoride, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

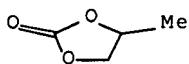
IT 294-93-9, 12-Crown-4 14187-32-7, Dibenzo-18-crown-6 17455-13-9, 18-Crown-6 33100-27-5, 15-Crown-5
RL: MOA (Modifier or additive use); USES (Uses)
(liquid electrolyte lithium-sulfur
batteries)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

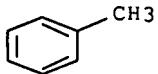
L62 ANSWER 14 OF 14 HCPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 1987:480996 HCPLUS Full-text
DOCUMENT NUMBER: 107:80996
TITLE: Nonaqueous electrochemical cell
INVENTOR(S): Whitney, Thomas A.; Foster, Donald L.
PATENT ASSIGNEE(S): Duracell, Inc., USA
SOURCE: U.S., 6 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 4670363	A	19870602	US 1986-910694	198609 22
WO 8802188	A1	19880324	WO 1987-US2191	

			198708
			31
W: AU, BR, DK, JP, KR			
RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE			
AU 8780375	A	19880407	AU 1987-80375
			198708
			31
EP 282576	A1	19880921	EP 1987-906615
			198708
			31
R: AT, BE, CH, DE, FR, GB, IT, LI, LU, NL, SE			
JP 01501026	T	19890406	JP 1987-506017
			198708
			31
CA 1282825	C	19910409	CA 1987-547554
			198709
			22
DK 8802823	A	19880707	DK 1988-2823
			198805
			24
PRIORITY APPLN. INFO.:		US 1986-910694	A
			198609
			22
		WO 1987-US2191	A
			198708
			31
AB	An improved electrolyte for an alkali or alkaline earth metal battery comprises an alkali-metal or alkaline earth salt complexed with a monomeric or polymeric polyfunctional chelating tertiary amine containing ≥ 2 N atoms, a 1st solvent selected from aprotic aromatic organic solvents and their mixts., and a 2nd solvent selected from aprotic organic solvents having a dielec. constant $\epsilon \geq 20$ and their mixts. The 2nd solvent is present in an amount sufficient to increase the conductivity measured at 25° and 1 kHz to $\geq 10-3/\Omega\text{-cm}$. The 1st solvent is selected from the group of C6H6, MePh, xylenes, pyridine, and N-methylpyrrole. The 2nd solvent is selected from the group of sulfolane, 3-methylsulfolane, and 3-methyl-2-oxazolidinone (I). The tertiary amine is selected from the group of pentamethyldiethylenetriamine (PMDT), tetramethylethylenediamine, tetramethylcyclohexanediamine, hexamethyltriethylenetetramine, and tris-(β - dimethylaminoethyl)amine, and their mixture. The resp. conductivities at 25° of 0.8 M LiI.PMDT in MePh, I, and 1:1 (volume) MePh-I were 1.3 + 10-5, 6.2 + 10-3, and 7.2 + 10-3/ $\Omega\text{-cm}$. High cycle lives of Li batteries having the invention electrolyte are also reported.		
IT	108-32-7, Propylene carbonate 108-88-3, Toluene, uses and miscellaneous 110-86-1, Pyridine, uses and miscellaneous 126-33-0, Sulfolane.		
RL:	USES (Uses)		
	(electrolytes with solvent mixts. containing, conductivity of, for batteries)		
RN	108-32-7 HCPLUS		
CN	1,3-Dioxolan-2-one, 4-methyl- (CA INDEX NAME)		



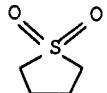
RN 108-88-3 HCAPLUS
CN Benzene, methyl- (CA INDEX NAME)



RN 110-86-1 HCAPLUS
CN Pyridine (CA INDEX NAME)



RN 126-33-0 HCAPLUS
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-14
INCL 429196000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST lithium battery nonaq electrolyte; iodide
lithium pentamethyldiethylenetriamine battery
electrolyte; toluene methyloxazolidinone battery electrolyte; elec
cond battery electrolyte
IT Batteries, secondary
(lithium, with electrolyte containing lithium salt
complexed with tertiary amines in organic solvent mixture)
IT 96-54-8, N-Methylpyrrole 108-32-7, Propylene carbonate
108-88-3, Toluene, uses and miscellaneous 110-86-1
, Pyridine, uses and miscellaneous 126-33-0, Sulfolane
646-06-0, Dioxolane 19836-78-3, 3-Methyl-2-oxazolidinone
RL: USES (Uses)
(electrolytes with solvent mixts. containing, conductivity of, for
batteries)

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